JOURNAL OF GAS LIGHTING, WATER SUPPLY, &c.

EDITOR & PUBLISHER: WALTER KING. OFFICE: 11, BOLT COURT, FLEET ST., LONDON.

VOL. CI., No. 2342.—TUESDAY, MARCH 31, 1908.

EDITORIAL NOTES—GAS, &c.

Concurrent Powers, not Concurrent Operation.

As was expected would be the case, the Long Eaton Gas Company have had inflicted upon them, by a Committee of the House of Commons, the penalty attaching to long neglect and to subsequent adoption of peculiarly trenchant methods for the sole purpose, not of level business competition with a Company with whom they had in certain territory concurrent powers of supply, but of driving that Company into submission to their will, although they had served, for many years, with satisfaction to the consumers and with business ability, that territory, which had been left derelict by the Long Eaton Company. It is not a modern neglect on the part of this Company, but one of very long standing; and we are convinced that this neglect, and the methods applied to try to regain that which had been lost by neglect, are sufficient to alienate the sympathy (as it did that of the House of Commons Committee) of any tribunal who have the power to give and to take away. It is all very well to boast of statutory rights; but Parliament expects those rights to be exercised both in accordance with the spirit and the letter of the enactment. If those rights are not so exercised, then Parliament reserves to itself, as the Long Eaton Company have learned, the power to abrogate them. If the Company now appeal to the Upper House against the present decision, we feel they will only be courting a second condemnation of their inaction over years and of the sharp practices they have had recourse to in recent times. Of this assurance can be given, that, had the positions of the Draycott and Long Eaton Companies been reversed, our sympathies and those of other disinterested people would have been with the latter.

It has been a keen fight in the district between the Companies; and no less keen before the Committee over which Mr. Whitbread ably presided. The Draycott Gas Company are asking Parliament to put an end to a condition of affairs that they feel to be most unjust, a menace to their stability as a concern operating under the authority of Parliament, and opposed (so far as the price charged by Long Eaton is concerned) to the intentions of Parliament. Parliament, of course, did not give the Long Eaton Company the right to charge a shilling excess outside their town district, under any expectation that the Company would reverse the position, and be hereafter supplying in the extra areas at a considerably lower price than in the town district. The additional price was given solely for the purpose of covering the higher costs that are inseparable from supply outside the more compact town area. It is trifling with the question to say that consumers in the town area are not injured by the lower price in the outside area. If the price charged outside is a commercial and profitable one, then, *a fortiori*, that same price should be so in the town proper. There is a direct injury, however, for the low price charged outside shows conclusively that, if that price did not exist, a uniform price lower than that in the town could be charged over the whole area. Parliament, too, many years ago gave to the two Companies—a proceeding contrary to modern practice—concurrent powers in this outside area. But there has not been a concurrent exercise of those powers; and while the Draycott Company have been serving the district in a manner that has commended itself to the House of Commons Committee, and that has pleased beyond all question the private and industrial consumers, and so have assisted in the development of the area, the Long Eaton Company have been inactive till the fruit was ripe, and they then went in to enjoy it, forcing in doing so a rate war for which even their own witnesses could find no parallel. There are no terms but those of reprobation to fit this kind of thing; and the description of the conduct of the Company deliberately applied by Sir George Livesey, and with still more poignancy by Mr. Corbet Woodall, calls for no qualification. It is sufficient for us that the Committee endorsed, and in effective manner, the views on this head of the Draycott Company's witnesses, among whom, in addition to Sir George Livesey and Mr. Corbet Woodall, were Mr. Charles Hunt and Mr. Thomas Berridge.

The veil that the Long Eaton Gas Company's witnesses assiduously tried to draw over the Company's aggressive and predatory action, relying for so doing upon the "concurrent "statutory powers," was seen through by the Committee; and the Company's feeble arguments (opposed to common parliamentary practice and experience in relation to gas supply) as to competition, and their trumpery charges against the Draycott Company in connection with matters that were not their concern, were put into the balance by the Committee, and were found seriously wanting. It is all very well to look valiant and to talk boastfully prior to getting in the presence of a Parliamentary Committee; but under such a cross-examination as the witnesses for the Long Eaton Company had to encounter, discomfort and confusion visibly put to rout all feelings of bravado. As the case proceeded, the confidence on the Draycott side stiffened, and perceptibly weakened on the other. It was a good fight; though the argumentative forces of the opposition were inevitably so deployed that each constituent was exposed to disastrous attack. If the Long Eaton Company (as, in the first hour of defeat, they seem inclined to do) have the tenerity, after cool consideration, to carry their attack on the Bill and defence of their action to the House of Lords, the advice may be tendered in all friendliness that their case should be considerably revised—leaving out much of the small talk about competition and such like, and the puerile references to little matters affecting the Draycott Company that do not concern Long Eaton. Such trivialities are not impressive in a Committee room; they are the signs of weakness. They do not give support to a case, but they do expose the difficulty of finding substance. Meanwhile, we offer our congratulations to the Draycott Company on their complete success. A still greater matter for congratulation, however, from a general point of view, is that Parliament can, through a Committee composed of men of judicial capacity, administer justice as well as confer powers.

The Conversion of Professor Lewes.

MONDAY of last week, in the lecture theatre of the Royal Society of Arts, witnessed the announcement of the conversion of Professor Vivian B. Lewes from high temperature carbonization for gas-works to extremely low temperature. He vaulted over the modern practices of gas technicians in a manner that was most alarming to his best friends. Practices constructed on many years of labour, and with the minds of many men during those years directed to their development in manner to realize the technical result from which the highest commercial gain could be produced, were set at naught and (in most friendly manner) ridiculed. And for what purpose? To revivify a process that began to decline immediately after it had made one bold struggle, under skilled financial generalship such as is found in the City, for a tentative existence. The case presented by Professor Lewes for the application of this low-temperature process of carbonization in gas manufacture was built entirely on hypothesis and speculation. These expressions are used advisedly; for a manufacturing process of this kind must be founded not solely upon technical ideals and upon efficiency, but on a foundation compounded of the best practicable technical procedure and practical and commercial requirement, in order to give the largest field to the manufacturer for producing profit that shall be, as far as is possible, assured and free from violent fluctuations. As a lecturer, Professor Lewes is excellent, clever, and (we

will even go so far as to say) fascinating. But, in this instance, he set himself to work on the dual and, under the circumstances, difficult task of destructive criticism and constructive support; and the finished result was that several of the elemental considerations were missing, and his audience—largely lay—were left in possession of only half the tale. However, though the lecture as delivered leaves one in a dubious state of mind as to whether Professor Lewes has himself "gravely considered" all the facts of the matter, our readers will no doubt give to it the "grave consideration" that the learned lecturer desired it should receive, though it may be expected that the "self-complacent egotism" which he attributes to the gas managers of the country will exactly express the view they will entertain of the author of the lecture, if he expects that his deliverance will be received as a complete case for the application in gas-works of the low-temperature system of carbonization as proposed to be practised by the Coalite Company, wherein the temperature is dropped down to between 400° and 500° C.

To all intents and purposes, the proposal of Professor Lewes is that the gas manufacturer shall change front, and make what are now his secondary products his primary products, and his prime and protected product (protected from ordinary gas competition) his secondary product. This he purposes doing by a process that will render in the result, per ton of coal, 5000 cubic feet of 20-candle gas, rather more than 12 cwt. of a smokeless fuel, 23 gallons of tar, and ammonia products. The figures in themselves do not look very attractive; but in a comparison of costs per 1000 cubic feet of gas made by high and low temperature carbonization, Professor Lewes puts a halo round them, by holding out the prospect of sending 20-candle power gas into the holder at 4·66d. per 1000 cubic feet, while 14-candle power gas, produced by the much decried methods of the gas maker of to-day, costs into the holder 10·52d. Those are the costs, less residuals. The figure for the latter gas, by the way, is for gas which the official returns show is of between 15 and 16 candle power, and not 14 candles. But gas in the holder at 4·66d. per 1000 feet as compared with 10·52d. is seductive, until the question is "gravely" looked at in other ways. The high temperature manufacturing costs per 1000 cubic feet, taking coal at 11s. 6d. per ton, are 20·04d., less residuals 9·52d. The low temperature manufacturing costs per 1000 cubic feet are 32d., less 27·34d. for residuals. In calculating the cost of the low-temperature residuals, the Professor assumes—and it is not a bad assumption when the matter is scrutinized from all points of view, including the costs of handling, distribution, capital expenses, and, last but not least, competition—that they will only realize the same market prices as the residuals of high-temperature carbonization.

The public, notwithstanding the memorable windy advertisements of the Coalite Syndicate, are not evincing any passionate desire for any smokeless fuels other than those already at their command; and it will take a great deal of educating to make them believe they are getting full value for money by paying a high price for partially carbonized coal. Then with regard to tar, notwithstanding all that Professor Lewes says as to its richness by the low temperature carbonization process, and the wide market that the products—motor spirit, lighting and fuel oils, disinfectants, lubricants, and insulating material—would command, he knows quite well that the present sources of supply for these commodities are completely equal to the demand, and that there is no sign of any perishing of their expansive capacity. This was a phase of the residuals question that was dealt with in our editorial columns on June 11 last; and it is not a sufficient answer to that criticism for Professor Lewes to airily remark that "the shock the *amour propre* of the gas industry received "at finding amateurs gravely proposing to show them how "coal should be carbonized, roused in them a feeling of rabid "resentment, which was admirably reflected in the articles of "the leading gas journals;" nor is the cavalier treatment sufficient that he administers to the question in other parts of the lecture. As has been previously pointed out in these columns, there is already an over-production of coal tar; and its output is being annually increased from coke-ovens and blast-furnaces. It will be shown presently that if gas makers follow Professor Lewes where he desires to lead, the production of tar would be increased to such an enormous extent that its very richness would be a lugubrious waste. The magnates of the oil market, too, would see to it that their interests were not jeopardized, in regard to the supply of motor spirit; and fuel oils to-day are also over-abundant without being supplemented. Moreover, gas-works could not, in addition to doubling the quantity of coal and enormously increasing the bulk of the products they would have to handle, put themselves individually in a position to enter upon the work of recovery from the tar of the products enumerated in the lecture; and the greater volume of crude tar would have to take its place, and fetch what it would, as a raw material. However the advice of the present counsellor of the gas industry is examined, only the one conclusion can be drawn, that he is advising the giving up of a certainty for an uncertainty, and that is speculation pure and simple.

On such considerations as these, the Professor's assumption (for the purpose of his calculation) that the coke, the tar, and the ammonia would only realize the prices he adopts—the prices of the present residuals of gas-works—has nothing about it that is very much amiss. Now instead of seeing what it cost respectively by high-temperature carbonization and low-temperature carbonization to put 1000 cubic feet of 14-candle and 20-candle gas respectively into the holder, let us see what a ton of coal carbonized by the two processes is likely to produce in the way of revenue. Last year, using a large proportion of Yorkshire coal, the London Gas Companies produced an average of close upon 11,000 cubic feet of gas per ton; and therefore Professor Lewes will not question a sale of 10,000 cubic feet of gas per ton. For this an average of 2s. 6·65d. per 1000 feet was received. Multiply this by 10, and the average receipts from gas per ton of coal were, we may take it, £1 5s. 6½d. The residual products produced 9·83d. per 1000 cubic feet of gas (only 0·31d. above the figure quoted by the lecturer). Seeing that an average of nearly 11,000 cubic feet of gas per ton of coal was produced, there can be no objection to taking 8s. 6d. per ton as the income from residuals. Therefore, from gas and residuals under high-temperature carbonization, a ton of coal produced about £1 14s. From a ton of coal treated by the low-temperature Coalite process, 5000 cubic feet of 20-candle gas is the production for sale. The Liverpool Gas Company supply gas of over 20 candles (tested by a flat-flame burner) for 2s. 6d. less 10 per cent., Edinburgh 20-candle gas for 2s. 9d., and Glasgow 18-candle gas for 2s. 1d. Therefore, it is not too much to say that, under current methods of using gas, the 20-candle make is worth to the consumer not more than 2s. 9d. per 1000 cubic feet, which would yield for the 5000 cubic feet per ton of coal 13s. 9d. Taking again the figures used by Professor Lewes for residuals, 27·34d., the yield from a ton of coal would be five times this sum, or 11s. 5d. The two figures therefore amount to only £1 5s. 2d., to bring in contrast with the £1 14s. But Professor Lewes will say why not add 300 cubic feet of blue water gas to each 1000 cubic feet, and break down the illuminating power to 14 candles. Very well. We have, under the circumstances, 6500 cubic feet for sale; and at last year's London average of 2s. 6·65d., that quantity would produce 16s. 7d. Add the 11s. 5d. for residuals, and we get a revenue of £1 8s. per ton of coal. The ton of coal, *plus* the fuel required for the blue water gas, therefore produces a revenue of 6s. per ton less than under the high-temperature carbonization process of a gas-works; and this 6s. is more than sufficient to pay the increased cost per 1000 cubic feet of gas into the holder, as suggested in Professor Lewes's lecture. But that gentleman will say, "The hole in your bucket is the "fact that I have not taken sufficient credit for the value of "the low-temperature process residuals." To that answer must be made that the residuals side of the question of low-temperature carbonization is, as we have endeavoured briefly to show, the most treacherous of all.

But whatever Professor Lewes may say—perhaps, however, he will follow his usual custom of thinking but saying nothing concerning the criticism—regarding the calculation as to residuals, there are several counterbalancing disadvantages to the low-temperature system of carbonization. He glides gracefully over sharp and awkward points. It is, however, insufficient to dispose of time, space, and capital considerations by saying that "the space occupied by the "low-temperature carbonizating plant is considerably less "than half that taken up by the ordinary retort-house." Under low-temperature carbonization, to produce the gas that is not required, the beautiful tar and the smokeless fuel (which will not be suitable generally for manufacturers), the carbonization plant is but the entrance to the enlarged expenses not calculated in Professor Lewes's manufacturing costs. Greater space will be wanted, and more capital will have to be expended, to deal with more than double the quantity of raw material that is now required to produce the

gas sold by the gas industry; and a vastly increased storage—and probably burying ground—will be needed for the tar produced. More than twice the quantity of coke will also have to be handled and sold—whether or not it is wanted. The quantity of coal that has to be handled now in gas-works to make the amount of gas needed in the British Isles is about 16 million tons a year; this would increase to at least 32 millions under the adoption of Professor Lewes's advocacy of the low-temperature process. Last year the London Companies produced rather more than 10 gallons of tar per ton of coal. Applying this round figure to the 16 million tons of coal, we have a present production of 160 million gallons of tar. Carbonizing at 400° to 500° C, the yield of tar would rise to about 23 gallons per ton of coal. Multiply the 32 million tons of coal by 23, and we get the enormous bulk of 736 million gallons of tar to be handled, stored, distributed, and disposed of, in place of the 160 million gallons at present produced, and for which fuel value is now paid. To deal with the more than duplication of these bulks of materials would greatly increase (for mechanical and storage plant) capital, staff, labour, and maintenance charges per 1000 cubic feet of gas; and these increases have to be set against any advantages that may be advanced. Are we wrong in saying that only half the tale was told by Professor Lewes? We are afraid he has allowed his conversion to low temperature carbonization to go forward without a complete consideration of all the financial and commercial aspects of the question. Ideals are not always practicable, nor do they always pay.

Before his proclamation, too, of the renunciation of the faith of the whole of the gas engineering profession, the Professor evidently had not heard (though we believe he has been in Germany and elsewhere within the last few years) of the application of high temperatures in connection with the vertical retort, in connection with retorts set at an unorthodox inclination, and in connection with horizontals in which heavier charges are placed, and carbonization proceeds for a longer period than has been customary. He has not heard of the high productions of gas of good quality by latter-day systems, of low labour costs, of the absence of stopped pipes and naphthalene, of (according to Herr Körting's tests) the reduction of bisulphide of carbon by more than 50 per cent., of the increased yield of ammonia, of improved tar and coke, and of the saving, by the vertical system, of ground space and retort-houses. Yet all these things are being accomplished under the high-temperature carbonization system, and are the answer to much of Professor Lewes's criticism. Another Cantor Lecture should be delivered to supply the omissions in the third. On the point of bisulphide of carbon, the recent official returns for London show that the violent fluctuations in grains of the early days in the purification changes are no more; and that round about 40 grains are fair averages for the week. The prospect of a great reduction of the sulphur compounds—to, in fact, a point near that mentioned by the lecturer for the highly virtuous low-temperature system of carbonization—is held out by a mere change of system on the high-temperature plane without any such revolutionary proposal as Professor Lewes advocates, of dropping to extremely low temperatures, sacrificing gas and revenue, and resting commercial success on the vagaries and the keen competition in an already overburdened residuals market. Under Professor Lewes's system, we can see the gas industry playing into the hands of competitors who are watchful on all sides for openings through which to make fresh attack. Practice, and profitable practice, is not to be overthrown to-day, any more than in the past, by mere hypothesis.

Delay in Publication of the Gas Returns.

Protest must be made against what appears to be growing dilatoriness of the Board of Trade in issuing the returns relating to authorized gas undertakings. It is bad enough that the returns refer to periods that antecede their publication by some twelve or fifteen months; but when their issue is delayed by further weeks and months, more of their value is at once sacrificed. The returns referring to Dec. 31, 1902, for the companies and March 31, 1903, for local authorities, were issued on Jan. 7, 1904. Those for 1903-4 were published on Feb. 20, 1905. The backward growth continued the following year, when the returns for 1904-5 were issued on Feb. 26, 1906. Last year we thought the department of the Board responsible for the returns were endeavouring to recover some of the lost ground; for Feb. 4 witnessed the issue of the returns for 1905-6. But here we are this year at the end of March, and no returns yet to hand for the year ending Dec. 31, 1906, and March 31, 1907. The latest official returns available are therefore those referring to periods two and two-and-a-quarter years ago. There is good cause for complaint here. The returns are very useful in the work before Parliamentary Committees; but we stand to-day in the position of having finished nearly all the contentious gas work in Parliament, and the only returns available are those for 1905 and the municipal financial year ending in March, 1906. It is hoped this reference and protest will have some effect in causing a little more alacrity in the production of the returns, the data in which are accounted on all hands as invaluable, and therefore much desired.

Federation of the Potteries.

In local government circles, much interest has been aroused by the stage to which the Local Government Board have succeeded in moving the project for the federation of the borough towns of Hanley, Burslem, Stoke, and Longton, and the urban districts of Fenton and Tunstall. The project, in a less ambitious form, has been in the inchoate state for many years; but nothing came of it but a considerable amount of controversy. Each town naturally had its own views, to which there was such attachment that compromise unassisted was entirely out of the question. Then the President of the Local Government Board took upon himself the duty of attempting to compose matters; but even his cogent influence did not convert the whole of the authorities and the ratepayers to a complacent frame of mind. But where Mr. John Burns is personally satisfied that public advantage is to be realized, any obstructive details adhering to the project are soon stripped off. There was, on his motion, a Local Government Board inquiry into the project after his own visit to the Potteries, and after his persuasive eloquence had been poured into the ears of those favourable and those recalcitrant. The next step of importance has been the reception by the Town Clerks and the Clerks to the Urban Councils of a draft Order for the federation of the towns named—Stoke-upon-Trent being the chosen name for the new county borough. From the time of receipt, fourteen days are allowed for the comments of the authorities concerned. It is necessary, if the matter is going to be finally dealt with this session, that the Order should be submitted to Parliament for confirmation before another six weeks have passed. There is thus no time to be lost, seeing that the Local Government Board have first to consider any representations made to them in regard to the Order.

Of course, our chief interest in the matter is in connection with the centralization of the administration of the gas supplies if combination is secured. The draft Order provides that the several Orders referring to the gas and electricity undertakings are to be repealed, and the undertakings placed under a new centralized Order. There are considerable interests involved here; and in the discussion of the financial aspects of federation, the terms of purchase of these undertakings by the new county borough were surrounded by much dissension. The Order, however, provides a financial basis, which amounts practically to a valuation of assets and liabilities on lines which are merely a modification of the scheme submitted by Hanley at the Local Government Board inquiry. While centralization of administration is, as a rule, productive of economies, it must be said that the towns in their separate existence have been well served in respect of gas supply; and we do not anticipate that the absence of the friendly rivalry that has existed between the gas undertakings in the Potteries will result in the consumers receiving any material advantage that they would not obtain under present circumstances. If the draft Order should be confirmed by Parliament, and centralization takes place, there is provision in the Order for compensation to displaced officials, in accordance with the Local Government Board Act, 1888, sections 118 and 119. But will the Order be confirmed? It is not unexpected that there will be a strenuously conducted opposition; and, if so, the fate of the Order hangs on a slender thread. The scheme, however, is being treated in some quarters (now that it is embodied in a draft Order) as though it was a certainty—only requiring modification (if any is necessary), the seal of Parliament, and the Royal Assent. It is not quite so near the end as that. If, however, it is carried through, it will be an honourable achievement for

those who have been engaged in it; and the situation that will be created in regard to the gas undertakings will be one involving interest for our professional readers, viewed from the technical, the commercial, and the personal standpoint.

Co-partners and Their Interests.

In the "JOURNAL" last week, reference was made to the influence that co-partnership has in assisting to the realization of the rights of property to protection, as illustrated by the action of those of the South Metropolitan Gas Company's workers who reside in the Peckham district in protesting against the Coal Mines (Eight Hours) Bill, which threatens their bonus and the dividend on their holdings in the Company, as well as the raising of the prices of their light, fuel, and other necessaries. Their protest, we believe, was carried to the ballot-boxes, and helped substantially in the return to Parliament of the candidate who is pledged to represent their interests in Parliament in this particular matter. Had it not been for the Coal Mines (Eight Hours) Bill, many of the men no doubt would have voted differently; but what strikes directly home is naturally one's first interest. On the day of the election, one gas worker, who had been on night duty, was seen giving up his day to looking up removals; and several of his fellow-workmen who had removed, were, through his energy, apprised of their right to a vote, and made use of their privilege. It was also said last week that co-partnership had introduced a new phase into our political life; and it can be seen, from the Peckham experiences, that it does induce a livelier interest among working men in the affairs of the day, and thus makes of them better and more useful citizens. This brings us to another point. Joint-stock companies are denied votes. When the employees become partners in such companies, and live in the area of the manufacturing and general business operations, those employees have an interest in exercising their rights as citizens in such a manner as shall best protect their personal affairs, which include those of the company with which they are financially associated. In the last County Council election, a great number of gas co-partners were for reform and less wasteful and more judicious expenditure; and in the parliamentary election at Peckham, they were strongly opposed to a measure that, in their opinion, bodes no good for the country at large. We have here an interesting and instructive development of the influences bearing upon our public life.

Rating and Interested Justices.

Early in the month Mr. Justice Darling and Mr. Justice Phillimore had before them an application that reminds of certain appearances of the South Metropolitan Gas Company in the Courts in connection with one of the Justices who assisted in the adjudication of their rating appeals. But the boot was on the other leg in this new case. The application was made by Mr. Page, K.C., on behalf of the Guardians of the Hendon Union. It was for a rule *nisi* for a writ of prohibition calling upon the Justices of Middlesex to abstain from hearing a rating appeal brought before their Court by the Metropolitan Electric Tramways, Limited, while certain members of the Middlesex County Council are upon the Bench. The Tramways Company are the occupiers of tramways in the Union of Hendon which are owned by the County Council. The tramways are leased to the Company upon a certain rent and 45 per cent. of the net revenue. It was therefore contended that the Justices who were also members of the County Council had a direct pecuniary interest in the appeal, and were in law disqualified from hearing it. It was remarked by Mr. Justice Darling, in delivering his decision, that (quoting from the "Electrical Review" report) the rule applicable to this kind of case had recently been stated in the Court of Appeal in the case of the Justices of London *ex parte* the South Metropolitan Gas Company; and it was obvious to his mind that any magistrate who was a member of the County Council might be objected to by reasonable or, if they liked, suspicious and uncharitable persons, who might say that, according as the rates paid were greater or less, so the revenue derived by the County Council from the tramways would be greater or less. The bias of persons having to decide a matter was not always in the direction assumed by uncharitable persons. It depended upon the character of the person. There were many having a pecuniary interest if it was not vital to them, who would be more likely to decide against their pecuniary interest than in favour of it. Still the decision would then be biassed; and, therefore, objectionable. He did not say more, except that he thought enough had been urged to entitle the applicants to a rule *nisi*. Mr. Justice Phillimore concurred in this expression of opinion; and the application was granted.

An Old-Age Pension Suggestion.

There appeared in a recent issue of "The Times" a letter occupying more than two columns, and bearing the signatures of six gentlemen who, as our contemporary remarks, "have in one way or another established a claim to be listened to with attention," on the subject of old-age pensions. The topic is now somewhat worn; but nevertheless the appearance of the letter at this juncture (when the Government are expected to do something in connection with the matter) cannot be considered inopportune. Dealing in the first place with the suggestion of a universal pension, the writers remark that the simplest calculation shows the cost at the outset must amount to some £27,000,000; and though the advocates of the scheme profess to reduce this to £18,000,000, and even £15,000,000, almost entirely on the assumption that a large section of the population would not take their pensions, they themselves have grave doubts as to the probable accuracy of this surmise. If the scheme of universal pensions as a civil right and without contribution be rejected, there is left the problem of relieving poverty in old age; and this the writers believe will be best met neither by a contributory nor by a non-contributory scheme singly, but by a combination of the two. Some maximum limit of private means must, they urge, be adopted to prevent persons receiving the pension who do not need it; and the pension relief should only be given according to the ascertained needs of the applicant—consideration being given to his capacity for work, to any earnings he may have from partial employment, to his health, or to other determining conditions. There is, they say, no virtue in fixing the same amount of pension for all applicants; nor is there any object to be served by requiring tests of merit or thrift, though, if the pensioner is found incapable of using the relief for the end for which it was granted, the pension authority should have the power to take any necessary steps to prevent waste or misuse. In addition, the writers contend that no scheme of free State pensions to the poorer section of the aged population will be satisfactory unless it is accompanied by a parallel scheme of assisted insurance, under which the pension obtainable would be higher than the normal amount of pension relief granted under the non-contributory scheme. But they leave open the question of whether this should be carried out through the Post Office Savings Bank or on the German and Belgian plan of contributions from employers and employed, supplemented by the State. While the practicability of such a two-fold scheme as this, they urge, should, even at the eleventh hour, be considered, the writers "view with the gravest apprehension the possibility that the Government may yield to the temptation of meeting the general demand for a solution of the problem by providing a slender scheme of free State pensions—slender enough to be within the compass of the £5,000,000 or so that the Chancellor may find at his disposal, and so limited in regard to the qualifying age or the amount of the pension that it will fail to give satisfaction to any section."

Lighting Matters in Liverpool.

A great deal of information with regard to lighting affairs in Liverpool is to be found in the annual report of Mr. A. G. Smith, who fills the offices of Superintendent of Street Lighting, Gas Examiner, and Official Inspector of Meters to the Corporation. The main features of the report (which deals with the twelve months ending Dec. 31 last) are published elsewhere in to-day's issue; and the first point of general interest is the statement that an experiment on a fairly large scale with regard to the automatic lighting and extinguishing of the street-lamps is at the present time being carried out, and will be reported upon at a later date. On the question of meter testing, Mr. Smith has a good deal to say; and it is to be noted that his department have joined with other testing-stations throughout the country in submitting to the Board of Trade recommendations for the revision of the existing regulations. The first of these is that the index of each meter should be made detachable, and subjected to a separate test. At Liverpool, by arrangement with the Gas Company, the indexes of

wet meters have always been tested, at a separate charge; and at Manchester, as "JOURNAL" readers are aware, the double test is also in operation. The index test is, however, at present only optional; and the desire is that it should be made compulsory. Among other changes sought are that meter-indexes should be standardized as regards the gearing of the wheels; that it should be compulsory for all meters to be retested every seven years; that provision should be made for testing prepayment attachments; and that the existing various methods of stamping meters should be changed in favour of a uniform system, in order to prevent fraud. The Local Government Board having refused to receive a deputation of the Liverpool Health and Lighting Committees on the subject of carburetted water gas, it was decided (on the report of the Town Clerk that the establishment of such a department could not be challenged, inasmuch as it would be self-supporting) to undertake the testing of consumers' gas pipes and fittings for soundness at the small charge of 2s. 6d. The result has been that many escapes of more or less extent have been discovered. Of 339 tests made, in 303 cases escapes were found varying from very small amounts up to about 80 cubic feet of gas per hour. In his capacity as Gas Examiner, Mr. Smith reports that the average of a large number of tests for carbon monoxide showed the presence of 12·1 per cent., indicating an admixture of 25·4 per cent. of carburetted water gas; but as much as 18·6 per cent. of carbon monoxide, representing an admixture of 52·5 per cent. of carburetted water gas, has been found at Garston—the average of the tests in that portion of the city indicating an admixture of 47 per cent. of carburetted water gas. Last year the public lighting of the city, and the supervision of the gas supply, cost £51,125; but a revenue of £3006 for work charged to other departments brought the net expenditure down to £48,119.

NOTES FROM WESTMINSTER.

THE last of the gas measures to come before "First House" Committees was the Draycott Gas Company's Bill; and it goes forward uninjured to the next House. Water measures have been sprinkled among other work that various Committees have undertaken—a particularly interesting one being the Slough Bill, proposing the compulsory purchase of the Water Company's property. A decision somewhat out of the ordinary was, it will be seen, arrived at by the Committee. Towards the close of the week, proceedings in the rooms tailed off to a fine point; and the little burst of enthusiasm in our particular lines has completely disappeared—for a time, at any rate, perhaps completely this session. Anyway, there can only be at intervals now miscellaneous matters to deal with, unless the passing of Bills into the second House brings surprises.

Draycott v. Long Eaton. The contest between the Draycott Gas Company and the Long Eaton Gas Company was witnessed to a clear finish on Thursday morning—the proceedings having commenced (as mentioned in the "Notes" last week) before Mr. Whitbread's Committee on Monday. It had been anticipated, since the Bill was deposited by the Draycott Company, that this would be the fight of the session, and the one that would produce the most interest and novelty; and there has not been disappointment in these respects. Both parties started before the Committee full of confidence; but disinterested observers soon saw that the stronger case was with the promoters of the Bill, and this view was confirmed by the decision of the Committee, which put the representatives of the Long Eaton Company into a very dejected frame of mind. The Draycott Company, in their Bill, asked for much fresh authorization, but the only part around which there was contention was that praying for the repeal of the Long Eaton Company's powers in a district over which the two Companies have for very many years held concurrent powers, but which district has only been cultivated for any length of time by the Draycott Company, and from a period when the Long Eaton Company absolutely declined to spend money in it. But early last year—the Draycott Company having, by years of labour, prospered in the district—Long Eaton stepped in, and conducted a competition with the smaller Company that, in spirit and act, divulged but a single motive. It has been said the decision of Mr. Whitbread's Committee caused the representatives of the Long Eaton Company to return home from the defence at Westminster of their one-time inaction and latter-day action in a somewhat dejected frame of mind. And sufficient was the decision, altogether just as it is, to make them so; for no half-measures are to be found among the Long Eaton Company's methods of warfare. Above £3000 have, it transpired during the evidence, been spent by them in laying mains in the territory in question, money has been expended on fittings, meters, and stoves, and on canvassing, and gas has been supplied in competing with the Draycott Company at a price 8½d. per 1000 cubic feet below that at which supply is given in Long Eaton. On top of this is the money spent on fighting at Westminster. Consequently, unless the Company take the matter to the House of Lords (the wisdom of doing which is very questionable, for the chances are that more money will be squandered and the ignominy of further defeat suffered), and succeed there, their long immovability in looking after the gas supply of the district, and their excesses when they did move, will have cost them altogether a pretty penny. But this is entirely their own fault.

Points from the Evidence. Both Companies came before the Committee strongly represented. Mr. Honoratus Lloyd, K.C., Mr. G. J. Talbot, K.C., and Mr. R. S. Clease appeared for the promoters; Mr. Balfour Browne, K.C., Mr. Fitzgerald, K.C., and Mr. C. C. Hutchinson for the Long Eaton Gas Company. The witnesses for the promoters were (in the order called) Mr. J. N. Derbyshire (the Chairman of the Draycott Company), Mr. Corbet Woodall, Sir George Livesey, Mr. Charles Hunt (Mr. Thomas Berridge, of Leamington, was also retained), and several owners of property, who testified to the successful and business-like way in which the Draycott Company have, under the present direction, fulfilled their parliamentary obligations. The history of the whole matter was placed before the Committee by Mr. Derbyshire. The acts of the Long Eaton Company were described by Mr. Woodall as "scandalous and disgraceful;" while Sir George characterized it as "atrocious" that the Long Eaton Company should have gone into the district and supplied at 8½d. below home prices, after having neglected the outer area for over a quarter of a century. Let the managements of any gas company put themselves in the position of the Draycott Company, and then ask whether the descriptions applied by the witnesses to the actions of the Long Eaton Company are not those that they would apply themselves, and perhaps with greater emphasis, under similar circumstances. The futility of competition of gas with gas was shown to the Committee from past experience. With a commodity like gas, the distribution plant for which calls for such a large capital expenditure, competition must ultimately be injurious to consumers and competitors alike. In the end, it must be the consumers who have to pay for the waste expenditure in duplicating plant, where one plant is fully capable of doing the work. Certain of the witnesses for Long Eaton—the principal witnesses were Mr. George Stevenson (the Secretary and Manager), Mr. E. H. Stevenson, Mr. Arthur Valon, Mr. William Newbigging, and others—tried to prove the contrary, and signally failed. If competition in gas is good in this small district, the logical conclusion is that it would be good throughout Long Eaton; and if a company with plenty of money at its back went into Long Eaton and supplied at 8½d. below their present price, what do the Long Eaton Directors think would then happen? After the evidence laid at their instance before Mr. Whitbread's Committee last week, the Directors of the Company could not object to Parliament trying an experiment by conferring upon someone competitive powers for gas supply in the town. It was made as clear as anything could be, by both the promoters witnesses' and the cross-examination of the Long Eaton witnesses, that the price charged in the disputed area was not a price produced by ordinary competition, but a price adopted solely for a present and obvious intention; it was not a price arrived at as the natural outcome of competition, but a speculative and temporary bid for custom, having for its object the driving of the Draycott Company to the wall; and it was a price that would have been abandoned when its work was done. There was much fencing over this competition question by the witnesses for Long Eaton in cross-examination. For instance, Mr. E. H. Stevenson, while saying how good competition is in this particular district, was not prepared to support competitive powers to-day being granted as a general policy. Of course not; and we can imagine what Mr. Stevenson's course would have been had he been a Director of the Draycott Company, and not a witness for the Long Eaton Company. There would have been warm times for someone. Why was the shilling excess (not rebate) accorded by Parliament to the Long Eaton Company for outside supply? The same witness supposed it was to tempt the Company to supply outside, but he had, in effect, to confess that the 1s. temptation had not proved so strong as the success of the Draycott Company in developing the area in question. Again Mr. Stevenson referred to the Draycott works as being starved. He had not seen them! His judgment was based on the accounts only! Mr. Woodall and Mr. Hunt had seen them, and spoke to the contrary. Mr. Newbigging, on the Long Eaton side, actually saw the Draycott works under reconstruction three or four years ago. Yet it was stated with all coolness that they are "starved." Again, consumer after consumer came along, testified to good conduct on the part of the Draycott Company in price and service; Mr. Woodall and Mr. Hunt were impressed by their management and success; and Mr. W. Newbigging—remember he is an opposition witness—frankly confessed that the Company had done good work for themselves and the public. In face of this evidence, there was an attempt to pick holes in the Company over the most trivial matters. And what were a Committee of independent men to think of a case constructed as was this one of Long Eaton, with every part met by overwhelming and destructive denial? There was a suggestion made that the smaller Company should be absorbed by the larger one; and the proposal came from the Long Eaton side as their eyes were opened wider to the weaknesses of their own case. But the idea came to nothing; and we are glad it did not, in view of the efforts that have been made to depreciate the Draycott property.

Committee's Decision. The Committee's decision gave much satisfaction; and it was not altogether unexpected by Long Eaton, though its sweeping condemnation was a crushing blow. The Committee had grasped the points of the whole matter completely. They saw that, though concurrent powers were granted to both Companies in the territory under discussion, only one Company had done anything to supply the area until within the last few months. Therefore there had been no concurrent exercise of the powers. Neglect on one side; action on the other. And, as a consequence, the Committee's view was that the Draycott Company should be confirmed in their business in the district in question. The Committee, however, gave the Long Eaton Company a portion of territory to which it was considered they have a right; and they thought it correct, too, that the Company should have the privilege of laying a main through the Draycott area for the purpose of reaching Risley. The Long Eaton Company refused to stay to consider clauses, which indicates the possibility of a further fight. Reflection in calmer moments may induce them to see the frailties of their case as others see them, and as exposed in the Commons, as well as the uselessness of throwing away further money.

A Water-Works Purchase Proposal. The Committee sitting under the chairmanship of Sir Henry Kimber have adopted a somewhat novel course in settling a Bill. They, in effect, give the Slough Water-Works Company the option of saying whether or not a Bill, promoted by the Slough District Council and supported by the Eton Rural District Council, providing for the compulsory acquisition of their works, shall proceed or not. The decision is tantamount to saying that the Committee are not oblivious to certain advantages of the water supply of a town being in the hands of a public authority; but they are not in this case satisfied that there has been any dereliction of duty on the part of the Company to warrant the Committee depriving them of their property without their consent. The matter is to be finally settled before the Committee to-day. The proceedings occupied several sittings; and the matter was left in this way: If the Company accept an offer by the Council of a sum in Consols, or its equivalent in cash, that would produce the total maximum dividends now paid (£2768), together with the back-dividends to which the Company are entitled, with 10 per cent. for compulsory purchase, compensation to the officers and Directors, and take over a loan of £5000, the Committee will, subject to the consent of the ratepayers, allow the Bill to proceed. There are therefore three conditions upon which the Bill may proceed: An offer by the Council of nothing less than the terms named by the Committee (the Council are not likely to offer anything more), acceptance by the Company, and acceptance by the ratepayers. The conditions are singular; but there is in them the saving of a good deal of time, trouble, and expense (if accepted) in carrying through the transfer. There were no allegations of any wanton disregard on the part of the Company of their obligations to the public, excepting that it was thought the charges were somewhat high; and the whole case for transfer was built up on the ground of public policy. It cannot, of course, he denied that there are arguments that are favourable to a water supply being in the hands of local authorities; while there are countervailing arguments regarding the expropriation of even a water company who are in all respects doing their duty to the public. The former position was put well by Mr. W. A. M'Intosh Valon (of Messrs. W. A. Valon and Son), who was very careful to say that his arguments did not apply to gas, inasmuch as there are other methods of obtaining both light and heat, but there is no substitute for water. The supply of water is necessarily a monopoly, and should therefore, in Mr. Valon's view, be in the hands of an authority who would administer it on public grounds, and not for private advantage. Of course, the argument in opposition to this is that, if it is so essential that water supplies should be in the hands of public authorities, it is a pity they left, in such a large number of cases, the inception of such undertakings, and their development, to private enterprise and private money, instead of taking the initiative themselves on public grounds. In hygienic and sanitary reasons, and in the further one that local authorities are not hampered the same way as companies in the development of works by the expenditure of capital that must necessarily be unproductive for perhaps some years, Mr. Valon found considerations favourable to water supply being a municipal possession. The position in which the Committee left the matter is interesting; and it will be with curiosity that we shall look for the decision of the Company to-day.

Pontypridd Water. It will be remembered that Lord Clinton's Committee gave the Pontypridd Water Company one of the two watersheds which they asked for in their Bill; and this practically meant cutting down the dimensions of their scheme to one-half. When clauses were under consideration last week, Mr. Ernest Hill, the Engineer for the scheme, put in a revised estimate of the cost of the works consequent upon the decision of the Committee. One of the reservoirs and a line of pipes through the Rhondda Valley having been eliminated, the estimate was reduced to £285,000—the new capital to be raised being £350,000. A curious objection was that of the Local Government Board to the proposal of the Company to make bye-laws for the regulation of the new watershed, in order to ensure the purity of the water. The Home Office also submitted there was no precedent for a private company being given such powers, which, it was considered, might be employed to the serious prejudice of the owners. Bristol is a contradiction of this. In view of the opposition of the departments, the Committee eliminated the proposed power. It would have been easy enough to have made the power conditional in a manner to guard against any high-handed proceeding on the part of the Company. Purity of the water supply and the health of the community should stand before the sentiment of any Government Department.

Closing of Water-Valves. A Water Company have obligations to perform, and their operations must follow a systematic course, or there may be serious consequences. The Finchley District Council tried in their Bill to get a power over the heads of the Barnet Gas and Water Company that, if granted, threatened disastrous consequences to the water system, consumers' fittings, and the supply. The power they sought was the unprecedented one of giving to the captain or superintendent of the Fire Brigade the power to open the Company's valves at his own discretion, and at any time, in the event of fire. The Council made out no case for such a privilege. They could only point to an insignificant fire in a field in connection with which any friction had arisen between an officer of the Fire Brigade and an official of the Water Company with regard to the opening of valves; and they entirely failed to prove the necessity of the power being conferred. The discussion on the subject is sufficiently interesting to deserve the report published in our "Parliamentary Intelligence," which report shows that the Police and Sanitary Committee declined to extend the law on such evidence and argument as the Council were able to adduce.

Glyncorrwg Water. The Bill promoted by the Glyncorrwg District Council has had completely taken from it the water scheme delineated in it; the remaining portions being allowed by Mr. Mooney's Committee to proceed. At the bottom of the removal of the water project is the scheme of the Glamorganshire County Council to form a Water Board for the district. It seems likely that the Council will be devising their scheme at once, and will be up with a Bill next session.

Wolverhampton Water. The Police and Sanitary Committee of the House of Commons last week had the Wolverhampton Corporation Bill under examination. In the course of their investigation, they deleted a clause that proposed to impose on owners a fine not exceeding £5, and a daily penalty not exceeding £1, for permitting a house to be occupied without a sufficient water supply. A clause dealing with the cleansing of cisterns was also struck out.

GAS STOCK AND SHARE MARKET.

(For Stock and Share List, see p. 856.)

At last it is possible to record that the Stock Exchange has had a really cheerful week, such as it has not had for a long time past. Not that business was as abundant and active as could have been desired. Things will not go full speed ahead all at once. Besides, it was account week; and the settlement engrossed its share of attention. Still, the tone was bright and cheering; and prices improved under favourable influences, chief among which was the cheapening of money, which brought hoards out of deposit demanding advantageous investment. The movement was slow at starting. Monday was so lifeless that prices remained steady through sheer inanition. On Tuesday they roused up, and the tendency was buoyant pretty well all round. Good investments advanced, headed by Consols with a rise of $\frac{5}{8}$. Wednesday was quieter; but nothing dimmed the brightening atmosphere, and prices continued to improve. Thursday opened in the same mood; but some amount of realizing to secure profits ensued, which steadied the advance awhile. Friday saw the upward movement again in full swing; and the strong position continued till the close, though Saturday was a good deal quieter. In the Money Market, there was a good demand for short loans, which eased after the conclusion of the settlement. Discount rates also relaxed. Business in the Gas Market was rather quieter, but the tendency was undiminished in firmness. Actual changes in quotation were very few in London; but there were more in the country markets. In Gaslight and Coke issues, the ordinary was moderately active at rather better figures; but the quotation was not advanced. Monday had one transaction at 96. This was not repeated, however, and 96$\frac{3}{4}$ and 97 were afterwards marked several times. The secured issues were fairly active. The maximum changed hands at from 87$\frac{1}{2}$ to 89; the preference from 107$\frac{1}{2}$ to 108$\frac{1}{2}$; and the debenture at 83$\frac{3}{4}$ and 84$\frac{1}{4}$. South Metropolitan was quiet and unchanged; transactions ranging from 121 to 122. The debenture was done at 85. Commercials were hardly touched. The 3$\frac{1}{2}$ per cent. was done once at 104; and the debenture once at 83$\frac{1}{2}$. In the Suburban and Provincial group, Alliance old was marked at 20$\frac{3}{8}$ and 20$\frac{1}{2}$, British at 43$\frac{7}{8}$ *cum div.*, Brentford old at 242, and Southampton at 109$\frac{1}{2}$. In the Continental Companies, Imperial was steady and more active, changing hands at from 178$\frac{1}{2}$ to 179$\frac{1}{2}$. The debenture rose a point. European fully paid was done at 23, and ditto part-paid at 16$\frac{1}{2}$ special. Tuscan debenture marked 99. Among the undertakings of the remoter world, Bombay new changed hands at 4$\frac{1}{2}$, Buenos Ayres at 11$\frac{5}{8}$ and 11$\frac{3}{4}$, ditto debenture at 94, Monte Video at 11$\frac{1}{4}$, Primitiva at 6$\frac{3}{4}$, ditto debenture at 94 and 94$\frac{1}{4}$, and River Plate at 13$\frac{7}{8}$.

ELECTRICITY SUPPLY MEMORANDA.

Points from the Meetings of the London Electricity Companies—Hopes and Fears as to the Effects of the Metallic Filament Lamps.

THE reports of the meetings of the London Electricity Companies afford interesting reading. They show increased business, but not a proportional increase of net profit, and they indicate an uncertain feeling as to the future. "There are too many uncertainties hanging over the industry for me to hazard prophecies," were words used by the Chairman (Sir Irving Courtenay) at the meeting of the Chelsea Company; and the accounts of the Company and of others show that Sir Irving is wise in his generation. The business of the companies generally has expanded; but the business in power and other uses—that is to say, the cheaper business—is expanding at a greater rate than the lighting business. Expenses continue to grow; and the lighting business—that part of the whole that is the backbone of the concerns, and the part that carries the heavy weight of capital and other charges (apart from works costs) on much of the power and heating business—is threatened with a certain amount of reduction on account of the metallic filament lamps. In the case of the Brompton and Kensington Company, it was stated that there had been a reduction in the receipts from supply since the charges for power and heating had been reduced, and the profits were necessarily smaller. The net result of the working in consequence was only an increase of £335 in the profits. At the meeting of the Kensington and Knightsbridge Company, Colonel Crompton spoke of reductions of price having had to be made "in order to compete with gas and other illuminants." The Chelsea Company, with an increase in gross receipts amounting to £3443, only showed a net increase of £1285. The principal directions in which costs advanced last year or half year, as the case may be, were in coal and rates and taxes. New machinery has done well for some of the Companies in producing economies in works costs; but they have not been sufficient to counterbalance the accumulating load of other expenses. An instance of the effect of the heavier coal bills, is the addition under this head of £4500 in the case of both the Westminster and the Charing Cross Companies, £1304 in the case of the Chelsea Company, and £5420 in the case of the County of London Company. The other Companies also suffered in the same direction.

At nearly all the shareholders' meetings, the gravity of the increasing rates and taxes, due to the higher ratings sustained in the quinquennial re-assessment, was expressed. The Chelsea Company complain of an increase of £695 in their payment for rates; the total amount now paid representing $\frac{2}{5}$d. per unit sold. Consider this charge per unit in relation to the prices charged for electricity for power and heating. The County of London Company paid £911 more for rates; and the Charing Cross Company, £2293. Increased charges of this kind, in face of declining average receipts per unit, are not looked upon with anything that can be described as equanimity. Again, while the figures that have been published—to support power schemes—as to the potentialities of the power business in the Metropolitan area are regarded generally by the present suppliers as a myth, we have the London Electric Supply Corporation reporting a "slow" increase in the lighting business, and the Chairman declaring that it is in the supply of power, both wholesale and retail, that the future of the Company lies—indeed, the Company have already become more a power than a lighting one. Respecting the Joint Committee and other Bills before Parliament dealing with the London electricity supply problem, these received at the meetings general approval. It is considered that in these schemes there are centred economies. Among other points it is regarded as somewhat wasteful that under present circumstances, at the 70 separate generating-stations in London, reserve plant should have to be provided and maintained; while combination and intercommunication would render much of this stand-by provision unnecessary. Another point of general interest is a reference in the City of London Company's report to the experiment in street lighting in the City with modern arc lamps. It is hoped by the Directors—they can do nothing more than hope—that this demonstration will prove the superiority of electricity for lighting purposes. Small as the demonstration is, the costs incurred by the Company (to say nothing of those incurred by the Charing Cross Company) amounted up to Dec. 31 last to £1115. The items constituting the sum are not stated.

At most of the meetings, the metallic filament lamps came in for notice. The financial effect that these lamps are going to have is an unknown quantity; and the Chairmen of the Companies have been exceedingly careful to make their predictions as evasive as possible. There was a time when it was said by the electricians that people did not want so much light as the incandescent gas-burner gave them, and that, by a proper disposition of the low candle power carbon filament electric lamps, all the light that was requisite could be obtained, and the cost of electricity be reduced, so the better to compete with incandescent gas lighting. That is nearly all dropped now. To-day it is being said, or rather hoped, that the metallic filament lamp is going to do for the electricity industry what the incandescent gas-mantle did for the gas industry. It is believed that the metallic filaments will tend to make electricity cheaper and more popular, and will, as one Chairman put it, "educate the public up to put more light into their houses." There is an over-confidence displayed, however, which concrete figures do not justify. Colonel Crompton, for example, believes that the new lamps will show the public that the cost of the electric light has reached such a figure that no other illuminant can compete with it successfully; that its cheapness is such that it will be used far more wastefully; and that it will be considered far more of a necessity, and less of a luxury, than it has been in the past. But where these lamps have been introduced, and can be used singly, there the consumption of electricity has been reduced to from one-third to one-half. But such places are few, unless a transformer is used. The confidence expressed by Colonel Crompton is somewhat dimmed by the uncertainty contained in a sentence dropped in the middle of his panegyric on the new lamps. "But," he said, "I believe that we shall not permanently suffer." Other Chairmen—before the shareholders—are also hopeful. Mr. Edmund Boulnois says the introduction of metallic filaments tends to prevent a large increase in the sales of electricity for lighting; but in time, real benefits will be obtained by the Company by the lamps inducing other customers to come in. The Chairman of the South Metropolitan Electric Light and Power Company also referred to the "temporary loss" and the visionary "ultimate benefit." Of course, reduction of the cost of any commodity does tend to make business more secure, does tend to greater use, does widen the area from which new business is obtainable. But if the electricians are depending upon the experience of the gas industry with the incandescent gas-mantle, they are depending on an unsafe peg. They should not forget that the gas industry has always had more than one string to its bow. In gas a tremendous business is done in cooking and heating at level prices with lighting; the gas power business is not carried on at below cost price; and gas in its commercial position is backed by revenue from residuals. The metallic filament lamps are entirely in the nature of an experiment without precedent, and among the possibilities of the future stands the necessity for a revision of electricity prices. With low-priced electricity for power and heating, consumption on the decline for lighting purposes through the metallic filament lamps, lessened revenue per consumer, and, in the distribution department, capital expenditure increasing per consumer in proportion to the business to be done owing to the more economical lamps, it seems that before long prices and new conditions will require special adjustment. On the other hand, there are those with an eye on the prospect of a diminishing income per consumer who seem to find some consolation that technical and other difficulties in connection with the new lamps have not been completely surmounted. In these comments, allusion has not been made to all the remarks on the subject by the Chairmen at the London Companies' meetings; but quite sufficient quotation has been made, for the references had a common likeness.

THE "BUISSON HELLA" COMPANY.

THE undertaking which was registered a short time ago under the title of the Universal Gas Methane and "Buisson Hella" Company, Limited, and whose prospectus (which, by the way, was remarkable more for what it left unsaid than for the information that was actually contained in it) was dealt with in the issue of the "JOURNAL" for Feb. 4, has been brought into prominence in the past week in connection with the dramatic arrest in Paris of M. Henri Rochette, who is described as the promoter of the concern.

It may be remembered that the prospectus claimed to be issued "For Public Information Only," and that its lack of definite particulars on essential points rendered it of no very great utility for this purpose. However, from among the facts that were stated, it could be gathered that the capital was no less than £600,000, divided into 300,000 7 per cent. preference shares of £1 each, and 600,000 ordinary shares of 10s. each. The preference shares alone were offered for subscription; and these had conditions attached to them which were calculated to detract from, rather than to add to, the attraction which they might otherwise have possessed as an investment. The purchase price of the patents payable to the vendors (the Mining and Industrial Corporation, Limited) was given as £480,000; and it was intimated that the minimum on which the Directors would proceed to allotment was the subscription of 100,000 of the preference shares, which subscription at par had been guaranteed by the Banco Franco-Espanol—a bank about which little (if any) information seemed available in this country at the time. Certain questions were raised as to the patents which the Company had acquired, or intended to acquire; and then came a break, during which, no doubt, the whole matter passed from many people's minds. In the "JOURNAL" last week, however, was reproduced from a French contemporary a report that the new filament mantles would soon be on sale at a price of 2 frs. 75 c. (2s. 3d.) each, and that an experimental plant was about to be put up for testing the methane gas invention.

Whether these statements will in any way be modified by the events which took place just as the "JOURNAL" containing them was going to press, it is impossible at present to say; but the arrest of M. Rochette is reported to have led to a collapse of the shares in the various undertakings with which he was connected.

These Companies make a long list; and among them is to be noticed the Franco-Spanish Bank, and the first and second "Hella" Companies. The final "Buisson Hella" Company was apparently the last of his flotations; and, according to rumour, it is in connection with transactions that have taken place with the inventor of a water-meter that the *débâcle* has come about. A telegram of Tuesday's date from Paris stated that after the "Buisson Hella" was registered in London in January, the stock was placed in France, and the price of the 10s. shares reached 58 frs., from which height they fell, on the promoter's arrest, to 8 frs. In connection with the question of company registration, a correspondent of the "Financial News" says: "The Rochette affair has once more brought to the front the question of typically French enterprises being constituted as limited liability concerns under English company law. Opinions of the best authorities are that the French Government will at the earliest opportunity lay before the Chamber a Bill which will prohibit the constitution under foreign laws of any concern which has its field of exploitation exclusively in France, and the shares of which are destined to be introduced on the Paris market." Many calculations have been made as to the losses that will be sustained by investors through the arrest, on a charge of fraud, of M. Rochette; but it can hardly be otherwise than of a very serious extent.

OBITUARY.

The Barnard Castle Gas Company have just lost a useful member of the Board by the death of Mr. JONATHAN HILDRETH DAWSON, who had been a Director since September 1876, when he succeeded his father in the position. At the annual meeting of the Company last Tuesday, a resolution of regret and respectful sympathy with the family was passed.

The death occurred last Thursday week of Mr. JOHN MARTIN, who for nearly fifty years was Engineer and Manager of the Ormskirk Gas Company. The deceased, who was in his 79th year, retired from this position about six years ago, and since then had been in a delicate state of health. He was held in the highest esteem by the Directors of the Company, for whom he was a devoted and faithful servant; and he was well respected in the town and district. The funeral took place at Ormskirk; and among those present were Mr. Thomas Holcroft, Chairman, and three Directors of the Company. The body was borne to its last resting-place on the shoulders of workmen in the employ of the Company.

The death at Cannes, early last Tuesday morning, of the DUKE OF DEVONSHIRE calls for notice in these columns on account of the interest he took in questions affecting the large body of workers in this country, and particularly for one which touches closely a section of those workers who are connected with the gas industry. The late Duke was Chairman of the last Labour Commission, of which, as is well known, Sir (then Mr.) George Livesey was a member. His Grace had heard, during his Association with the Chairman of the South Metropolitan Gas Company, of the profit-sharing scheme which had been established by the Directors; and on the occasion of the fifth annual "Bonus" festival at the Old Kent Road, on July 28, 1894, he attended the gathering, and was presented with an elegantly framed illuminated address, in which the Workmen's Committee tendered him their earnest thanks for the interest he had always shown in the welfare of the working classes, and expressed the hope that his presence and influence might be the means of extending the profit-sharing system. In the course of his reply, his Grace said the scheme was one of the most successful—he believed *the* most successful—of the attempts which had been made to solve the problem of how the too-often conflicting interests of Labour and Capital might be brought into harmony, and how differences between them might be avoided. It appeared to him that the Directors and men of the South Metropolitan Gas Company had hit upon a most admirable and ingenious way of combining the interests of Capital and Labour and those of the consumer. He concluded by expressing his satisfaction at being present, and by wishing that such a spectacle as was presented by the meeting were a more frequent one. Since that noted gathering, the profit-sharing scheme has developed into co-partnership; and his Grace's wish has been in a certain sense realized, as the system he was commending has been adopted in other gas undertakings far removed from the one in which it originated.

Sir JAMES MARWICK, who was for a long time Town Clerk of Glasgow, died at his residence there last Tuesday evening. Sir James was the eldest son of a merchant in Kirkwall, but was born in Leith in July, 1826. He studied law in Edinburgh, and he became partner in a legal firm in that city in 1854. In 1858, he was elected to the Edinburgh Town Council. A year later the Town Clerkship of Edinburgh became vacant; and in order to comply with the self-denying ordinance, Mr. Marwick, by request, retired from the Council for a year. At the end of that time—in 1861—he was unanimously elected to the office, which he held till 1873, when he had the good fortune to be appointed by the Town Council of Glasgow (who were also unanimous in their choice) to the Town Clerkship of that city. This office he held till December, 1903, when he retired. He received Knighthood from Queen Victoria in 1888, on the occasion of her visit to the Exhibition in Glasgow. The University of Glasgow had previously conferred upon him the degree of LL.D., and before that, again, he had been elected a Fellow of the Royal Society of Edinburgh. The Glasgow gas transfer took place in 1869—four years before Sir James Marwick became Town Clerk—but in all the subsequent legislation for the city, his was the guiding hand. Of his service in this respect it is recorded that—"With truth it may be said that to Sir James Marwick more than to any other man was due the credit of framing the different schemes of municipal enterprise which have proved so successful, and which have attracted the attention of not only every municipality in the kingdom, but all over the world." A greater distinction, however, than this rests upon his name; for it has been the practice of successive public officers, when drafting legislative measures, to consult Sir James Marwick; and thus he has left the impress of his hand upon the Scotch municipal legislation of the past thirty years. The funeral took place on Saturday, at Edinburgh, and was attended by representatives of the Town Councils of Glasgow and Edinburgh, as well as of many other public bodies.

THE GAS-ENGINE.

THE enormous progress made by gas or internal-combustion engines in recent years, and the increases obtained in efficiency, are such that reliable books devoted to their theoretical and practical study are both welcome and necessary. So far as America is concerned, however, the adoption of the gas-engine has been slow compared with that in Europe, though it is understood that considerable progress in this work is now being made. Our friends across the water have therefore been in the past to a great extent dependent upon home practice for reliable data—data which has been easily obtained because freely published. There are, as is known, several admirable English treatises on gas-engines which might be deemed to serve the purposes of both countries. But the American advance is such as necessarily to lead to the issue of American text-books; and we have to hand an excellent volume on the subject as an example.* It professedly deals with theory and application, and not with gas-engine design—the latter being intentionally omitted because of the publication of a book on this particular phase by Professor C. E. Lucke, a colleague and co-worker of the author's. We must at once say that if this impliedly companion volume is equal in interest to the book under review, the pair will be eminently serviceable to all engaged in gas-engine problems. Professor Hutton's treatise, consisting of 552 pages, is an able discussion of the principles and practice of the whole field of gas-engine work, outside mechanical design, and it will well repay study. So far as the mere student is concerned, physical and mathematical knowledge are, of course, assumed—mathematical calculations being freely used; but the latter are by no means a deterrent for the unlearned in an intelligible comprehension of gas-engine working. At the same time, there is a tendency to express mathematically much which could be more simply stated.

In these days of competitive fuels, one looks particularly for the standpoint of the author. Professor Hutton had in his first edition (1903) evidenced his belief in small gas-producers in combination with internal-combustion engines. Our readers, therefore, must not expect to find town gas in any place of prominence. Indeed, quite the contrary; for, in an exhaustive summary of gaseous fuels, illuminating gas has been purposely placed quite low in the list, since the author considers that in the future producer or fuel gas will be made and distributed through town mains for the purpose of the internal-combustion engine. It is probably due to this that, in giving particulars of fuels and the like, greater attention is paid to producer apparatus, both of the pressure and aspirating or suction types, than to other gas-making systems. Town gas is very briefly described, and carburetted water gas not at all, notwithstanding the fact that there must for years to come be engines working with town gas. Nevertheless, the author, on the whole, is comparatively unbiassed, and describes with some fairness the various fuels and their action; taking gas-engines of all kinds as his province.

The book quickly carries the reader on to the subject of the liberation of heat energy, which, with the phenomena of combustion, fuels, gas-making plant, gases evolved, with their chemical and calorific values, and methods of testing same, are dealt with very fully. The chapter is a fairly complete one; starting with fundamental principles and laws, and showing their application to practical work. It includes many useful calculations and data, and finishes with a carefully summarized table of the various fuel gases, giving for each the chemical composition and calorific values, the quantity of air required for combustion, and the value in British thermal units per cubic foot of the resulting combustion mixture. Particular attention is directed by the author to this table and its availability for use in determining mean effective pressures. Some comparisons of cost of fuel per horse-power-hour are made; but the author in several cases has evidently used old data. In one example the consumption of an engine is given as 24 cubic feet of illuminating gas per horse-power-hour, the thermal efficiency being credited at only 20 per cent. The next chapter treats of the mechanical energy from the expansion of gas and air. Dealing again with

* "The Gas-Engine." By F. R. Hutton, Professor of Mechanical Engineering in Columbia University. New York: John Wiley and Sons. London: Messrs. Chapman and Hall, Limited; 1908. [Price 21s. net.]

fundamental laws and expressions, the author discusses the work done in the cylinder, gives calculations for determining mean effective pressures, and thermal and mechanical efficiencies. In a table showing the probable range of mechanical efficiency values in engines of different sizes, he appears to err on the low side; giving values of 74 to 80 per cent. only for engines of 4 to 25 I.H.P., and 79 to 81 per cent. for those of 25 to 500 I.H.P.

The book, though recently published, has no reference to the work of the Investigation Committee of the Institution of Civil Engineers on the efficiency of internal-combustion engines. In speaking of combined mechanical and thermal efficiency, the author comments upon what he considers the desirable tendency in recent contracts between engine makers and buyers to base the agreement on the output of horse power per unit of the fuel to be supplied. The method, while excellent for the purchaser, probably presents too many difficulties for adoption. The cycle of operations which the heat medium undergoes during the transformation of heat energy into mechanical work is well discussed in the succeeding chapter. In this section, the relative advantages and disadvantages of internal-combustion engines are clearly and usefully stated, though in the enumeration of the arguments against the engine are included several disadvantages which are not inherent, being due to avoidable faults.

The author deals with the chief types of engines; successively describing those burning gas, gasolene, kerosine, and alcohol, in each case making a comparison of the several types discussed. It is natural, perhaps, in an American book, that prominence should be given to engines of American make; and we find the Nash and Westinghouse accorded some considerable notice. These chapters are followed by discussions on the proportioning of combustion mixtures, carburation and carburettors, ignition, and governing. The subjects are well treated. The author deals with the combustion chamber and the exhaust in Chapter XIV. While recognizing the resultant increased efficiency, he appears to consider that there is a limit to high compressions due to the too ready ignition of rich mixtures. He gives a table of compression pressures in pounds per square inch for various gases as used in different kinds of engines. The limits thus stated are in some cases low. No reference seems to be made to the possibility, as stated by Professor Burstall, of designing engines for gases rich in hydrogen, which will give no trouble with high compressions, nor to that of reducing compression temperatures by the injection of water, though this method has recently been used with success. Premature ignitions are said to be traceable to dust, carbonized oil, and the like; and under such conditions they take place equally with weak as with rich gases. They are not, therefore, as the author half implies, a block to the high compressions; but at the same time it may be that the latter are not necessarily advisable for every engine. Useful information is given as to exhaust mufflers; and this is followed by very serviceable particulars as to the manipulation and testing of engines. In connection with the pages on failures in working, the author might usefully have given some directions to read and interpret the indicator diagram. The tabulated details of engine tests are not in a few instances sufficiently recent, with the result that from the data are deduced low efficiency figures and relatively high heat losses.

The book includes a highly mathematical analysis of the gas-engine and its cycles, with the view of obtaining serviceable statements as to the limits which theory imposes upon the development of this class of motor. The remaining chapters deal with engines heating at constant pressure, tests on explosive mixtures, and costs of operation. With reference to the latter, the author remarks that there has been some difficulty in getting reliable and unprejudiced data in America; and English figures require to be modified in consequence of the difference in social, labour, and fuel conditions. The book concludes with a very brief, but sufficiently useful, historical summary and bibliography.

Some little pleasure has been experienced in reading this volume, though at times we could have wished that the matter were expressed in much terser language. A certain amount of letterpress explanation of parts of plant might have been saved by diagrammatic illustrations, and the meaning of these would perhaps be much more quickly grasped by the majority of readers. Here and there information already given is repeated, and occasionally a printer's error is noted. An instance of the latter is found on p. 33, where British thermal units are stated as per cubic metre instead of per cubic foot. Generally speaking, the ground covered by the book is comprehensive, the descriptions are good, if now and then prolix, and the illustrations clear.

Our readers may remember that one of the proposals put forward for the mitigation of fog was that of Sir Oliver Lodge, who suggested that coal should be utilized at the pit-mouth for the generation of electricity, which could be transmitted to any required distance for lighting and heating. According to a paragraph in the Engineering Supplement to "The Times" of last Wednesday, a trial of this system is being carried out by the Société des Houillères, who are putting down a generating station of 30,000 H.P. to supply current for lighting and power purposes over a wide area in the industrial districts of Doubs and the Vosges, and the country round Belfort. This installation will be on a sufficiently large scale to test the comparative cost of energy transmitted in the form of electric current, contrasted with that conveyed in the form of coal.

ASSOCIATION OF WATER ENGINEERS.

The "Transactions" for the Past Year.

We have received the volume of "Transactions" of the Association of Water Engineers for the past year. It contains the papers which came before the members at the meetings held in Windsor and London respectively in June and December, under the presidency of Mr. Christopher Sainty, the Water Engineer to the Windsor Corporation, with the reports of the discussions thereon. These were duly noticed in the "Journal" at the time; but their value has been greatly enhanced by the numerous additional illustrations and plates by which the Inaugural Address and the papers are now accompanied. Those of our readers who were present at the summer meeting of the Association may remember that, in accordance with medical advice, the President's Address was read for him by the Secretary (Mr. Percy Griffith, M.Inst.C.E., F.G.S.), who pointed out that a great deal of interest centred in the illustrations; and the volume before us shows that the remark was perfectly justified. They are reproductions of prints, with descriptions translated from the Latin, which Mr. Sainty was able to lay before the members by the kindness of the Vice-Provost of Eton College (Mr. F. Warre Cornish, M.A.); and they bear out in a striking manner the statement made by the President in reference to them that the profession of water engineering is an ancient one, seeing that as far back as 1662 many devices for the utilization of water power now looked upon as modern were "the sport of inventors." The illustrations of old machinery (of which there are eleven) are preceded by a quaint frontispiece representing an exhibition of working models of wind and water machines by George Andrew Backley, Architect and Inventor, and bearing date the above-mentioned year. Another of these old plates, showing a high-pressure centrifugal pump, is particularly interesting from the fact that one of the papers read at the summer meeting—that by Mr. R. C. J. Dicken—was upon this subject. In calling attention to the number and variety of gears used in the devices shown, the President remarked that while engineers of the present day would hardly be tempted to abandon modern methods, in which the use of iron and steel has given us such advantages in the direction of strength and simplicity, one could not but admire the ingenious uses made of the very limited facilities available to the engineer of 250 years ago. The last print, showing an ancient fire-engine, and the primitive method of coping with what the reporters are fond of calling the "devouring element," presents a striking contrast to the modern system of fire-extinction.

Leaving these interesting examples of ancient appliances, we turn to a section of the contents which will always make the volume of special value to the water engineer. It will, doubtless, be in the recollection of our readers that at the close of the summer meeting a number of the members went over to Paris and spent a week in visiting the water-works. The account of this visit, for which the Association are mainly indebted to Mr. Easton Devonshire, occupies about 80 pages; and he supplemented it by some notes, to the extent of 26 pages more, submitted at the winter meeting. The interesting history and description of the water supply of Paris, and of the works and processes employed for the purification and filtration of the water, contributed by Mr. Devonshire, merit attentive perusal; and this will be facilitated by having all the papers in one volume. The members were accorded a hearty reception by the Municipality of Paris, by the Société des Ingénieurs Civils de France, and by the Engineers at the works visited. The other contributions to the proceedings of the Association last year include a description of the Windsor Water-Works by the President, and of the reservoir works of the Metropolitan Water Board at Staines by Mr. R. E. Middleton, one of the Engineers; a valuable paper by Dr. Thresh on the detection of pollution in underground waters; one on the right to use underground water, by Mr. A. B. E. Blackburn; and descriptions of the water-works at Milton-next-Sittingbourne, Scunthorpe, and Malvern, by Messrs. Gore and Deacon, Mr. A. M. Cobban, and Mr. W. Osborne Thorp respectively.

Among the remaining contents will be found a list of the principal legal cases relating to water supply heard last year, and a short report of the Frimley and Farnborough Water Company's case, relating to the construction of works on additional lands, which was decided against the Company, on the 28th ult., by Mr. Justice Swinfen Eady, whose judgment was upheld in the Court of Appeal last Thursday, as briefly reported in another part of the "Journal." There are also short notices of the life-work of the members removed by death during the year. Useful features of the volume are the summary of the contents of the preceding eleven volumes of "Transactions," and the subject-index to the entire twelve volumes, all of which are on sale; and prices, as well as a summary of the contents and the subject-index just referred to, can be obtained gratis on application to the Secretary, 54, Parliament Street, Westminster, S.W. It only remains to say that the frontispiece to the volume is a well-executed portrait of the President, and that the book has been produced under the editorship of Mr. Percy Griffith.

Yorkshire Junior Gas Association.—Next Saturday the members of the Association will visit the Cinderhills Fire Clay and Brick Works, Halifax, by invitation of Messrs. Joseph Morton, Limited.

THE INSTITUTION OF CIVIL ENGINEERS.

For some time past, it has been known that the present building of the Institution of Civil Engineers in Great George Street, Westminster, would sooner or later have to come down, to make way for extensions for Government offices. The recent completion of the fine block at the corner of Parliament Street and Great George Street, which is for the accommodation of the Local Government Board, has brought nearer the time when the Civil Engineers must find a new home.

From a circular-letter by Dr. Tudsbery, the Secretary of the Institution, we learn that a special general meeting of corporate members is summoned for next Friday, at three o'clock, to consider the matter. They are to be asked to authorize the Council to enter into an agreement for the sale of the Institution premises to the Government, which has presented to Parliament a Bill dealing with the subject. After much negotiation, a site for the new home of the Institution has been found at the corner of Great George Street and Prince's Street—that is, quite close to the Institution of Mechanical Engineers at Storey's Gate. Thus the long-established connection of the Institution of Civil Engineers with Great George Street will, happily, not be broken. A fact, however, not generally known, is that the first meeting of the embryo society, which led to the formation of the Institution, was held in the King's Head Tavern, Cheapside, on Jan. 2, 1818.

To revert to the circular letter. Dr. Tudsbery says:

> It has been felt by the Council that it would accord with the general wish of the members to provide in the new building not merely that increased office and other accommodation which is now required by the great growth of membership and business during recent years, but to make provision for the future, and to secure a new home for the Institution conceived on a plan and scale commensurate with its importance and prestige. To enable this wish to be carried into effect, it has been arranged that the site offered to the Institution shall comprise a considerably larger area than that of the present building; and special attention has been given to the possibility of including within the new building a hall of a character similar to those possessed by the great legal societies, which will afford facilities for the conduct of examinations and the holding of special meetings and gatherings, when the numbers present largely exceed those which the existing building can accommodate, and in which the memorials of eminent engineers may find a place.

The idea of a great hall is certainly a good one, and we should like to see in the new premises every provision made for the social fraternizing of members of the engineering profession, somewhat on the lines that exist in the higher branch of the legal profession. Such a hall will naturally add largely to the expense of building; and to meet it a special building fund has been started. It already reaches £7811; being the promised contributions of 34 Past-Presidents and members of the Council, among whom we note the name of Sir George Livesey for £200. It is hoped that all full members of the Institution will contribute one payment each of £10 10s., which is the amount that, in future, it is proposed to levy on all associate members who are transferred to the class of member. Previously there has been no fee to be paid on passing from one class to the other. A bye-law to this effect is also to be submitted to the special meeting next Friday, further providing that a full member shall pay, on his election, twenty guineas, half of which may be treated as revenue. "The revenue thus obtained," it is said, "will be fairly constant; and the contribution will fall upon those to whom such payment should not be a serious tax, while their annual subscriptions will remain at their present amount."

So many gas engineers are members of the "Mother Institution of Engineering," that the important changes about to be made cannot fail to be of interest. We shall rejoice to see an adequate central home for all engineers; and incidentally, we should like the power and prestige in it of gas engineering to be fully represented and properly recognized.

AN ITALIAN GAS AND ELECTRICAL DIRECTORY.

The Italian gas industry is already indebted to the Editor, Cap. Vittorio Calzavara, of "Il Gaz," for two or three books dealing with gas subjects. He has now compiled, in a paper-covered book of some 700 pages, a directory of men and things relating to gas, electricity, water, and telephones in Italy.* The first of the seven parts into which the book is divided consists of tables and other information of use to the Italian gas engineer and manager. In fact, under the headings of gas, coke, gas manufacture, purification, and distribution, one gets something of an epitomized elementary treatise on the subject, which may prove of use to the isolated small manager in the Italian peninsula. Thus he might read that "condensation must be progressive and rational. The temperature of the gas must be regulated according to the season, and the apparatus should be protected from sudden changes of temperature," and so on, dealing with different forms of condensers. So, too, with gasholders: "If their capacity is too small, it makes the distribution depend on the retort production, and places it at the mercy of an accident in the manufacture. If too large, it uselessly takes a serious amount of capital, besides being a basis of taxation. So, in ordinary circumstances, keep to three-quarters of or a day's maximum make." From these extracts, it will be gathered that the book is not solely and merely a "Directory," but aims at being a useful and practical guide in more technical matters.

After dealing in a somewhat similar, but not nearly so full, a way with electricity, a list of 181 undertakings is given, naming the town, proprietors, manager, and amount of gas sold in 1906. We select the following to give an idea of the respective importance of the larger Italian gas-works.

	Gas Sold in 1906. Cubic Metres.
Milan	52,000,000
Turin {Consumers' Company, 15,825,478 / Italian Company, 15,280,506}	31,105,984
Rome	20,791,867
Genoa	20,572,000
Naples	11,731,190
Palermo	8,265,000
Bologna	6,901,654
Venice	5,454,610

A list of 4053 electrical installations is given; but the great majority of these are, of course, mere private plants. No comparison can, therefore, be instituted between the gas and electrical undertakings. Perhaps in a future edition (for we understand that the "Directory" is to be an annual publication) the public electric works could be separated, and the small private installations classified apart. Of water-distributing undertakings, 346 are named; and telephone concessions and tariffs are tabulated.

Lists of members of the Italian Gas Society and of the Italian Electrical Association conclude the volume. It is one which, as we have said, is likely to prove useful, and which, with further classifications and additional information in future years, will become a serviceable guide.

* "Indicatore Tecnico Commerciale delle Officine Gaz Elettricità, Acquedotti, Telefoni d'Italia." By Cap. Vittorio Calzavara. Venice: "Il Gaz;" 1908. [Price, Lire 10.]

INTERNATIONAL ROAD CONGRESS IN PARIS.

On the 11th of October next, in the Jeu de Paume (Terrasse des Tuileries), Paris, will be opened the first International Road Congress. Its object is to bring together those interested in the study of roads, so as to make them suitable for modern methods of conveyance. The congress will last for seven days; and among the excursions will be one to Nice, to enable members to visit the roads in that neighbourhood specially made to suit mechanical traffic. The Presidents of the Organizing Committee are M. Lethier, Inspector-General of Ponts et Chaussées; M. De Zuylen, President of the Automobile Club; and M. Ballif, President of the Touring Club; while M. Heude is the General Secretary, at 244, Boulevard Saint-Germain, Paris. Four Committees have been nominated, dealing respectively with management and finance, technical matters, entertainments, and exhibits. The questions to be discussed are divided into two main divisions: (1) Construction and maintenance; (2) traffic and working. Papers may be submitted in English, French, or German. In the first division will be considered such questions as the bed and choice of coating of the road; cleaning and watering; utilization of tar and other products; and technical and economical results.

The Exhibition Committee are arranging for the show of variously classified objects, such as maps, statistics, models, and bibliographies. In the class of "Materials and Tools" may be exhibited tars, asphalt, various coatings and testing appliances for coating materials. Tarring or spraying machines will also be on view. Such a congress and exhibition should certainly be fruitful, at the present time, in focussing information upon an ever-increasingly important problem, in which it is to be hoped that gas-works bye-products will play their part. Any further particulars can be obtained from the Secretary of the Congress, whose name and address are given above.

We learn that on the occasion of the meeting of the Manchester and District Junior Gas Association at Warrington on the 11th prox., the visit of the members will not be to the gas-works, as stated last week, but to those of the Richmond Company, by invitation of the Directors.

At the meeting of the London County Council last Tuesday, the report of the Public Control Committee on the subject of carrying out a series of experiments with London gas, referred to in the last number of the "Journal" (p. 754), was received, and the recommendation adopted.

Mr. Arthur Mead, son of the late Mr. Arthur Mead, who was well known to many of our readers, has been selected to fill the vacant position of Superintendent of the Fittings Department of the Sheffield United Gaslight Company, for which applications were recently invited in the "Journal." Mr. Mead is at present with the Gaslight and Coke Company; and he is one of a little group of five of the Company's employees who distinguished themselves in the examinations in "Gas Manufacture" in 1899. On that occasion, Mr. Mead passed second class and secured a County Council scholarship of £5 and a certificate. Another of the group is now the Company's Chief Inspector; and the rest have left the service to take good positions with other companies. We congratulate Mr. Mead on his appointment, and cordially wish him success in his new field of labour.

FUEL AND ITS FUTURE.

High v. Low Temperatures for Coal Carbonization.

At the Royal Society of Arts, on Monday last week, Professor VIVIAN B. LEWES, F.I.C., F.C.S., delivered the third of his course of Cantor Lectures on the subject of "Fuel and its Future." It was specially interesting to members of the gas profession, a number of whom were present, as the concluding portion of it was devoted to the question of the employment of high or low temperatures in the carbonization of coal.

Professor Lewes began by reminding his audience that in the preceding lecture he had shown that for the generation of heat in most manufacturing processes an economy of at least 25 per cent. could be attained by gasifying the coal before use, as, though an initial loss of 20 per cent. of the calories was entailed by the process of converting it into poor fuel gas, the ease of application, the reduced volume of air needed to yield complete combustion, regeneration, and other economies of the same kind, brought up the amount of the thermal value of the fuel utilized from 10 to between 40 and 50 per cent., while the absence of smoke from the factory chimney-shafts would be a long stride forward in the work of cleansing the atmosphere—an aim which every thinking person had in view at the present time. Indeed, the whole question of fuel economy was, he said, so closely allied to the problem of smoke prevention that it was impossible to consider the one without alluding to the other; and if only sufficiently vigorous steps were taken to enforce rational methods of domestic heating, both economy of fuel and the cleansing of the atmosphere would follow.

The lecturer went on to show that in the South of England it is the domestic grate, using bituminous coal, that is the principal cause of the smoke cloud which hangs over the large towns. Taking London, he thought Dr. Shaw's estimate that 70 per cent. of the smoke is domestic would probably be about correct; but if statistics were collected in Sheffield or Birmingham, the figures would most likely be reversed. He remarked that though the smoke from the domestic chimney has from the earliest years of the Fourteenth Century down to the present day been execrated for the part it has played in the pollution of the atmosphere, it was surprising how crude are the ideas that exist as to its composition, and the method of its production. In the open fire, he said, the radiant heat given by the incandescent fuel was the heating agent; and, though undoubtedly it was wasteful in fuel, owing to by far the largest proportion of the heat escaping up the chimney with the products of complete and incomplete combustion, it was still so far more hygienic and more comfortable than any other method of heating, that one would be sorry to see its place taken by any other form of heat production, in spite of the economic advantages of central heating systems or slow-combustion stoves. With the ordinary grate using bituminous coal, the production of smoke meant waste of fuel; but great as this was in the aggregate, it was small compared with the other losses due to actions taking place in the fire itself, and the loss of heat escaping up the chimney.

Having described the action which takes place when bituminous coal is put on to a burning fire, Professor Lewes remarked that, in order to overcome the trouble of smoke while using solid fuel, many forms of grate had been suggested; the most successful of them being dependent upon the principle of feeding the fresh fuel to the bottom instead of to the top of the fire, so that as the tar, hydrocarbon vapours, and steam distilled out from the coal, they had to pass through a mass of incandescent carbon above, which decomposed the complex tar vapours into simple hydrocarbons, which were then completely burnt up on reaching the fresh air supply at the top of the fuel. The fact, however, that any special form of grate would require the removal of the old type and the introduction of the new, had, he said, been sufficient to prevent any success in such directions; and what had been needed to make smoke prevention a practical possibility was the introduction of a fuel which could in every way be treated like coal, would be as easy to ignite, would burn with a cheerful flame, and would, in reality, commence its combustion just at the period when in a fire the smoke had ceased and the fuel burnt clear. He had always been strongly of opinion that the only way in which the smoke problem could be solved was by stopping the direct combustion of bituminous coal in grates and furnaces, and employing the gas-works of the country to convert it into gaseous and solid fuel, both of which would give smokeless combustion, at the same time extracting in useful form those volatile products which in the manufacture of gas yielded tar, but in the stove or furnace formed smoke.

This remark led Professor Lewes to the portion of his lecture which specially concerned the gas industry. He pointed out that the domestic use of gas for heating purposes has advanced with great rapidity; and though its cost comes out considerably higher than that of coal, yet, when used under proper conditions, it is practically not much more expensive—the economy in handling and cleanliness making up for most of its extra cost. In a very large number of households at the present time, gas is employed for cooking and heating the bedrooms; while it is only in the sitting-rooms that solid fuel plays any important part. Coke, on the other hand, owing partly to prejudice and partly to the fact that it is difficult to ignite, and only burns freely when the stove happens to have a good chimney draught to aid it, has never proved a serious rival to coal. During the past year, however, the question of smokeless fuel had again come to the front. The idea of using low-temperature carbonization for the manufacture of coal gas, so as to improve the quality of the gas and other residuals obtained, offered, he said, a means by which a perfect domestic fuel could be made, which, igniting with greater ease than even coal, burnt in the ordinary fire-grate with a cheerful and smokeless flame, and emitted more radiant heat in a more uniform manner than any alteration in the form of stove could effect with bituminous coal.

The lecturer went on to refer to the paper read in 1886 by Mr. Lewis Thompson Wright, before the Society of Chemical Industry, under the title of "What shall we Do with our Tar?" in which he advocated its use as a fuel for heating gas-retorts; the object being to reduce the output, and so stem the slump in prices which had brought tar down from the position of the most paying of the residuals of coal distillation to so low a figure that it was practically a waste product.* In the discussion that followed the paper, Dr. Armstrong asked the pertinent questions: Was the gas maker right in his present method of treating coal? Would it not be better to deal with it so as to produce a large proportion of residuals and a different class of coke? Professor Lewes said that in the twenty-two years which have elapsed since these questions were asked, the gas managers of the country have not only ignored them, but have, "with self-complacent egotism that brooked no interference," worked in the exactly opposite direction; and now that the parliamentary standard of candle power has been lowered over part of London, and the necessity of purifying the gas from sulphur compounds other than sulphuretted hydrogen has been removed in order to relieve the companies from the burdens of enrichment and lime purification, "the temperature of distillation in some cases is being pressed to the highest point possible without entailing stopped ascension-pipes and naphthalene-choked mains." The result has been that in some districts the sulphur compounds in the gas, which increase with increase in the temperature of carbonization, have reached a proportion that proves disastrous to incandescent gas-fittings; and as the inverted incandescent burner is undoubtedly the means by which gas will chiefly be burnt in the future, the sulphur question once again threatens to become an important one. The lecturer gave as the reason which has led to this "craze for high-temperature distillation" the fact that it increases the volume of gas at the expense of the hydrocarbons present in both gas and tar vapour; so that, instead of obtaining 10,000 cubic feet of gas per ton of coal carbonized at the old heats, it is possible to obtain more than 11,000 cubic feet, but with an increase of hydrogen in the gas, and at the expense of loading the tar with particles of free carbon, to the general detriment of the pitch obtained from it.

Now that the pollution of the atmosphere of our large cities by smoke has become so bad as to rouse the smoke reformers once more to activity, and to lead to the demand that London, like New York, should be freed by State action from the curse of bituminous coal as a fuel, other thinkers, "untrammelled by a life's training in the gas-works," have seen, said Professor Lewes, that "the road to economy of fuel, smoke abolition, and an improved gas supply, lies in an exactly opposite direction to that which the gas manager has looked upon as the royal road to success." He pointed out that coke, the solid product of high-temperature distillation, has never found favour with the middle and upper classes as a domestic fuel, owing to its being somewhat difficult to ignite, and not burning freely; and its chief market has been for steam-raising and other manufacturing purposes—very little finding its way into the householder's grate. The result has been that, had not carburetted water gas offered a convenient and economical way of using it on the gas-works, many companies would have found great difficulty in keeping up the price during the years in which coal was cheap.

Under these conditions, Colonel Scott-Moncrieff many years ago suggested the use of a half-coked coal as a fuel supply, and tried to make a commercial article by carbonizing coal at the ordinary gas-retort temperature, drawing the charge when half the usual volume of gas had been distilled from it. Two factors, said Professor Lewes, led to failure—one being that the time was not ripe for it, and the other that the means by which he proposed to carry out his "entirely admirable idea" could never give a uniform fuel, for reasons which he would fully discuss a little later. The idea, however, again come to the fore; and a perfectly independent worker found the secret of successfully making, by the distillation of coal at a low temperature, a fuel which would ignite more easily than coal itself, burn freely with a cheerful flame in an ordinary grate, and yet be absolutely smokeless. The idea being taken up and vigorously pushed in the City resulted in the formation of a Company, and the shock which the *amour propre* of the gas industry received at finding amateurs gravely proposing to show them how coal should be carbonized, "roused in them a feeling of rabid resentment, which was admirably reflected in the articles of the leading gas journals." At the time of the exploitation of the process, he went very carefully into it, and was deeply impressed with the possibilities it presented. Since then he had had the opportunity of seeing and testing the progress made, and felt that, in the interest of the gas industry, it would be well if they would lay aside,

* See "JOURNAL," Vol. XLVIII., p. 788.

for the time being, their feeling against the process, and gravely consider the facts he desired to place before them. These facts, with the remarks upon them, constituted the remainder of the lecture, which is given practically as delivered.

When an ordinary gas coal is subjected to destructive distillation, the volume of gas, its heating and illuminating value, and the quantity and quality of the tar, undergo great changes, according to the temperature at which the distillation is carried out; and the following table shows the average results that are obtained with a good sample of gas coal:—

Yield of Gas and Tar per Ton of Coal Carbonized.

Temperature of Distillation. Deg. C.	Deg. Fahr.	Volume of Gas, Cubic Feet.	Tar. Gallons.	Sp. Gr. of Tar.
900	1652	11,000	9	1·200
800	1472	10,000	12	1·170
700	1292	9,000	15	1·140
600	1112	7,750	18	1·115
500	932	6,400	21	1·087
400	752	5,000	23	1·060

A glance at this table at once makes clear the position taken by the average gas manager, who argues that his duty is to make gas, and who looks upon residuals as more or less worrying factors, which, however, redeem their position by helping to pay the coal bill. As high temperatures yield most of the product that he desires, he strives to get the highest heat compatible with the life of his plant and the avoidance of stopped ascension-pipes; and in concentrating his attention on the volume of his gas, he loses sight of the damage he is doing to his residuals.

Tar, as made in the manufacture of gas—that is, at temperatures between 800° and 900° C.—is a product which bears very little resemblance, save in colour, to the liquid products that first distil from the coal; being largely built up of the products of secondary reactions taking place at the high temperature of the retort, such actions being responsible for the formation of the naphthalene and many of the aromatic hydrocarbons. If the temperature falls, owing to bad furnace arrangements, to between 600° and 800° C., these secondary actions are checked, and members of the saturated and naphthene series of hydrocarbons begin to make their appearance, and so complicate the separation of the benzene and other valuable constituents of the tar that the distiller fights shy of them, and the gas manager gets the idea that low temperatures ruin his chief liquid residual. If, however, the temperature be boldly dropped to between 400° and 500° C.—a temperature no one ever dreamt of employing for the carbonization of coal until the present process was introduced—the character of the tar entirely alters. The aromatic series diminish to a point at which they are not worth recovering, and paraffins and certain unsaturated hydrocarbons make their appearance in such quantity, that the first distillate gives a valuable motor spirit, which yields 12·5 per cent. better results than "petrol," and for which there is an ever-increasing market at higher prices than if benzol had been the product. In the same way, the middle oils are so altered in character as to be unrecognizable, and, being free from naphthalene, give valuable bye-products, or as crude distillates yield excellent fuel and enriching oils. The low temperature of distillation also has told its tale in the pitch; and as this contains no free carbon, it forms an ideal insulator, which in these days of electric traction becomes a valuable asset.

The gas also alters in composition with the falling temperature; and a glance at the following analyses shows at once that the increase of volume yielded by the high temperature has been at the expense of the degradation of the hydrocarbons, which, decomposed by the heat, have yielded hydrogen to swell the volume of the gas and free carbon to ruin the pitch.

Effect of the Temperature of Carbonization on the Percentage Proportions of the Chief Constituents of the Gas.

	400° C.	500° C.	600° C.	700° C.	800° C.	900° C.
Hydrogen	21·2	28·3	33·8	41·6	48·2	54·5
Saturated hydrocarbons	60·1	56·2	30·7	45·0	39·1	34·2
Unsaturated hydrocarbons	6·3	5·8	5·0	4·4	3·8	3·5

So that, though only 5000 cubic feet of gas are obtained from the coal, it is over 20-candle power, and has a calorific value of 750 B.Th.U. per cubic foot; while the low temperature of carbonization has reduced the sulphur compounds other than sulphuretted hydrogen to a point that would satisfy the most ardent stickler for purity. The temperature is too low to convert the full proportion of the nitrogen into ammonia, with the result that it is only two-thirds of the amount yielded per ton of coal that is obtained at the high temperature; while the coke produced is so different in character as to be a revelation to those who use it for the first time. An analysis of the coke made shows that the easy ignition and flaming, but smokeless, combustion of the low-temperature product are due to the high proportion of volatile matter still remaining in it.

Enough has been said to show that lowering the temperature of carbonization to a degree never before attempted, if done in the right way, entirely revolutionizes the products formed. New markets are created for the bye-products, which become of far greater value than the present coke and tar; while an illuminating gas of ideal composition and purity is produced. The gas industry, however, cares but little for these points; the fatal fact that only 5000 cubic feet, instead of more than double this quantity, of gas per ton is made needs some stronger argument than the desire of the public for clear skies and a better quality of gas supply to break down their opposition. But I think a little consideration of the financial side of the question must convince anyone with any knowledge of the subject that not only is every factor of quality in favour of low-temperature carbonization, but that the manufacturer's balance-sheet is the most overwhelming argument that can be produced in its favour. The fact that a temperature is employed so low as to be invisible in bright daylight reduces the wear and tear of the plant and brickwork to a small fraction of that entailed with high temperatures; the plant itself costs a quarter of the price of the ordinary retort-benches for a given make of gas, and occupies a far smaller area; while labour is reduced to a minimum by the feeding, discharging, and moving of the material being all mechanically carried out.

For the sake of argument, however, let us for a moment accept the *ipse dixit* of the detractors of the process, and imagine that the coal used costs the same as for ordinary gas making, that the smokeless fuel is of no more value than the ordinary gas coke, that the tar has none of the virtues attributed to it, and will command no higher price than the product—laden with naphthalene and free carbon—of over-carbonization, boldly face the deficit in ammonia, admit that no one wants 20-candle gas with only a trace of sulphur in it when he can get 14-candle gas with 50 grains of sulphur per 100 cubic feet, take the wages as being the same per 1000 cubic feet of gas as with high-temperature carbonization, and then compare the cost per 1000 cubic feet of the gas as it is being made by low-temperature carbonization at the present time, with the analysis of the returns of one of the largest companies using high-temperature distillation.

Comparison of Cost of 1000 Cubic Feet of Gas Made by High and Low Temperature Carbonization.

High Temperature.*	Pence.	Low Temperature.	Pence.
Coal at 11s. 6d. per ton	13·30	Coal at 11s. 6d. per ton (4 cwt.)	26·50
Purification	0·50	Purification	0·50
Salaries	0·54	Salaries	0·54
Wages	2·25	Wages †	2·25
Maintenance	3·45	Maintenance ‡	2·21
	20·04		32·00
Less residuals—		Less residuals—	
Coke, 0·82 cwt. at 12s. 3d.	6·11	Coke, § 2·4 cwt., at 12s. 3d.	17·64
Tar, 0·9 gallon at 1·5d.	1·30	Tar, 4·6 gallons at 1·5d.	6·90
Ammonia products	2·11	Ammonia products	2·80
	9·52		27·34
Cost of 1000 cub. ft. of 14-c.p. gas in holder	10·52	Cost of 1000 cub. ft. of 20-c.p. gas in holder	4·66
Calorific value, gross . 592 B.Th.U.		Calorific value, gross . 750 B.Th.U.	
Sulphur per 100 cub. ft. . . 43 grs.		Sulphur per 100 cub. ft. . . 18 grs.	

* The high temperature figures are for one of the London Companies not using water gas.

† In the low-temperature process, 11 men replace 50 men; so that, though double the weight is carbonized, the figure given is well above the actual.

‡ On account of a scarcely visible heat being used, maintenance is one-fourth that of high-temperature carbonization.

§ The low-temperature coke yield is two-thirds the weight of the coal taken (68 per cent. as a rule), and 10 per cent. on the weight is allowed for use in the gas-generator firing the retorts. In practice the fuel used consists of "bottoms" and screenings, and rarely exceeds 6 per cent. of the weight of coke produced.

In this comparison, the actual returns of the Company who have been pioneers in cheap gas in the Metropolitan district have been taken. No questions can arise as to the prices of coal and residuals, as the same prices are taken for each side of the table; and yet, with every item stated against low-temperature working, the price of the gas of high candle power comes out at less than one-half that produced as the outcome of a century of practice in our gas-works.

The criticisms which will be offered by the supporters of high-temperature carbonization will probably be: (1) That there will be no market for the low-temperature coke, as has been shown by the reception accorded by the public to imitations of this smokeless fuel made by the system introduced by Colonel Scott-Moncrieff; (2) that the residual market is already in so depressed a condition that an output of such an increased volume of tar would ruin it, and that the gas under these conditions would be more likely to cost 2s. 6d. than 4½d. per 1000 cubic feet; (3) that the day is gone by for gas of high candle power, and that the incandescent mantle does better with 14-candle gas than with 20-candle gas; (4) that the high calorific value of the gas would probably mean a lower consumpton, and so recoil on the gas-works; (5) that now the sulphur restrictions are withdrawn it does not matter whether there are in the gas 18 or 45 grains of sulphur other than sulphuretted hydrogen; and (6) that, only one-half the volume of gas being made per ton of coal, the factors of time and space would render the adoption of the process impossible, and that, if it were adopted in spite of this, the gas manager would be robbed of the valuable aid of carburetted water gas as a stand-by in case of labour troubles or suddenly increased demand.

Let us see what these objections really come to. Taking them in the order in which they are stated, I freely admit that the public are fully justified in declining such smokeless fuel as has lately been put upon the market by one of the gas companies, which, having been made by the Moncrieff process of carbonizing at the ordinary retort temperature, and drawing the charge when 5000 cubic feet of gas have been distilled off, suffers from the drawback that must render abortive all such attempts to make a smokeless fuel. Anyone who has worked on carbonization knows

that, owing to the porous character of coke, it is an excellent non-conductor of heat, and that this is one of the great troubles in gas manufacture, as it prevents the interior of a charge being raised to the desired high temperature without so overheating the exterior as to ruin the gas that has to pass through it from the core. When such a charge is drawn after 5000 cubic feet of gas have been distilled off, it is found that the exterior is ordinary gas coke (every whit as hard to ignite and as slow to burn), while the core is largely uncarbonized coal, which is by no means smokeless; while opening the retort to draw the charge creates such a volume of smoke that the works need to be in a very isolated neighbourhood to make it possible. The result of the process is that the manufacturer loses half the volume of his gas, and has no increase in quality or quantity of the tar to make up for it; while loss in ammonia also helps to either reduce his profits or put up the price of the fuel. The consumer on his part finds no uniformity in the fuel, and realizes that he might just as well burn a mixture of coal and coke.

Several gas managers have told me that they can make a smokeless fuel by dropping the temperature of their retorts by about 100°, and making 7000 or 8000 cubic feet of gas per ton. If they try it, they will find that in this case also they cannot properly get rid of the smoke-forming compounds from the interior of the charge without coking the exterior; and, what is worse, they will get an oily tar in which the unsaturated hydrocarbons and paraffins will so hamper the separation of the valuable bye-products as to make it of but little value, and commercial failure will again result. Success can only be achieved by boldly dropping the temperature to a scarcely visible heat—viz., 400°C. When this is done, the coke may be kept at it for almost any period without driving out any of those volatile hydrocarbons that give easy ignition and a smokeless flame; so that, if the charge is properly proportioned, time can be given to carbonize the whole mass to a perfectly uniform product, while the tar, as has already been pointed out, is so radically altered in character as to appeal to entirely new markets, and to entail considerably altered conditions of refining. It is these radical changes in the method of carbonization which are protected, and a study of which convinced the patent authorities of Germany, America, and England that the process is a novel departure from the well-worn paths of gas and fuel production.

The second objection to the process has been partly answered. Motor spirit, lighting and fuel oils, disinfectants, lubricants, and insulating material, all command a market wider than is the case with the gas-tar products, and will have but little effect upon the price of the benzols and anthracene, as, unless it is found desirable to "crack" some portion of the low-temperature tar with a view to their formation, this tar would never be treated for their recovery. With regard to the low-temperature coke, I have no doubt as to it not only finding a wide and ever-increasing market, but that it will eventually displace coal as a universal fuel. It must be borne in mind that the earnest efforts of the smoke reformers have in the past always been defeated by there being no practical means by which the abolition of smoke could be brought about, and the pollution of the atmosphere, which has become little short of a national disgrace, prevented. The gas-stove offered a solution. But gas was dearer than coal; and there exists a large class of householders whose love for the homely, comfortable, pokable fire will never allow them to give up solid fuel, and who, though they freely admit the importance, from every point of view, of cleansing the atmosphere from smoke, still decline to further it at the cost of their own pocket or comfort. Now that low-temperature coke is available, the case is entirely altered; and this most fascinating and effective of fuels should, in conjunction with the gas-stove, rid England of the reproach of her smoke-darkened centres of industry, and not only improve the health of the nation, but also bring about an economy in our depleted coal supplies that will materially aid in prolonging Britain's supremacy among the nations.

The argument that the day of high-power gas has passed is a perfectly sound one; but the fact that 20-candle gas is made at the works does not necessarily imply that gas of that quality would be distributed. Gas containing about 60 per cent. of methane specially lends itself to dilution by water gas. It has now been amply proved to the gas industry that by the Dellwik process blue water gas can be made on the works at 3½d. per 1000 cubic feet; while if a portion of the low-temperature coke were used for its generation, it would itself contain a certain percentage of methane, with the result that 1000 cubic feet of 20-candle gas, diluted with 300 cubic feet of water gas, would yield 1300 cubic feet of 14-candle gas, with a calorific value of 600 B.Th.U., and containing only 14 grains of sulphur per 100 cubic feet. The objection that high calorific value would mean lowered consumption, is met by the last answer; but even if the 20-candle gas were distributed undiluted, everyone having experience of the ways of consumers knows that economy in consumption is the last thing studied. The tap is always turned on full, and the only alteration would be that the consumer would get more heat.

The idea that, now that the restrictions have been removed, the amount of sulphur does not matter, is, to my mind, a most dangerous one for company and consumer alike. The sulphur clauses were repealed on the gas companies showing that when unrestricted the sulphur in the form of compounds other than sulphuretted hydrogen had never exceeded 35 grains; and Parliament accepted this as a fact. No sooner had the clauses been abolished than one company at least, by pressing temperatures to the highest pitch and using inferior coal, made and distributed gas containing far higher proportions; and though other companies were wise enough to still partially retain lime purification and avoid any such excess, a continuance of this policy is quite likely to lead to the sulphur clauses being re-imposed, especially if methods of gas manufacture are available which without lime purification yield results well within the old limit.

Twenty years ago, Mr. Lewis Thompson Wright * pointed out the effect the temperature of carbonization had upon the formation of carbon bisulphide, and showed that good gas coal, which at moderate temperatures gave 27 grains of sulphur per 100 cubic feet, would, when the temperature was pressed, yield more than 40 grains; and one of the fascinations of still lower temperature carbonization is that a greater diminution in sulphur compounds can be obtained.

The objections as to time and space in reality disappear when one considers the fact that, though double the quantity of coal has to be handled to yield the same volume of gas as by high-temperature carbonization, yet the space occupied by the low-temperature carbonizing plant is considerably less than half that taken up by the ordinary retort-house; while, as already shown, blue water gas would in all probability be employed for diluting the rich gas down to the required standard. The apparatus could readily be fitted with carburettors for use in cases of labour troubles and fog; and as the volume of gas to be dealt with remains the same, the purifying apparatus employed would not need any alteration.

From 16 to 17 million tons of coal are annually carbonized in the gas-works of this country; while upwards of 35 million tons of bituminous coal are used for domestic purposes and the pollution of the atmosphere. If low-temperature carbonization for the production of gas were universally adopted, it would mean that 34 million tons of coal would be carbonized for gas-making purposes, yielding 22 million tons of low-temperature coke, some 20 million tons of which would be available for domestic fuel; while 3·4 million tons of tar would be formed.

Should it ever come to pass that a general adoption of low-temperature distillation provided these enormous volumes of bye-products, the fuel oil would be sufficient to supply the British Navy, and render it independent of coal and foreign oil supplies; while the motor industry would be free from the fear that oil "rings" and the decreasing output of petrol would cripple their business, and the economy in coal would be enormous.

In bringing his interesting lecture to a close, Professor Lewes said he hoped he had given his audience something to think about. In the concluding lecture, delivered last night, he dealt with gaseous fuel and power production, and the internal-combustion *versus* the steam engine.

* See "JOURNAL," Vol. LI., p. 281.

Scottish Junior Gas Association (Western District).—The annual general meeting will be held in the Lansdowne Restaurant, Hope Street, Glasgow, on the 11th prox., under the presidency of Mr. W. Wilson, of Falkirk. The business will consist of the appointment of officers and Council for the session 1908-9; and it will be followed by the first annual dinner of the members and friends.

Masonic "Evening Star Lodge," No. 1719.—The installation meeting of this lodge was held last Wednesday, at the "New Gaiety Restaurant," Strand, when the retiring Master (W. Bro. Walter T. Dunn) was heartily congratulated on the successful year of office he had enjoyed, and was presented with a P.M.'s jewel. The new Master—Bro. Glover Clark—was duly installed in the chair, and appointed and invested his officers as follows: Bro. Jacques Abady, S.W.; W. Bro. William A. Surridge, J.W.; W. Bro. Henry J. Davis, P.M., Treasurer; W. Bro. W. D. Child, P.M., P.P.G.St.B. Essex, Secretary; Bro. Cyril G. Davis, S.D.; Bro. William Edgar, J.D.; Bro. E. G. Smithard, I.G.; W. Bro. F. W. Cross, P.M., D.C.; W. Bro. Chas. W. Offord, Organist; and Bros. T. G. Marsh and A. E. Croager, Stewards.

The Acetylene Association.—The Association, who have been in the habit of holding their annual meetings in February, will meet this year in connection with the Fifth International Congress for Acetylene and Carbide of Calcium and the Fourth Meeting of the International Committee for Acetylene and Carbide of Calcium, to be held on May 28, 29, and 30. The business of the congress will be transacted in the Chemical Society's rooms, at Burlington House; and visits to places of interest and an official dinner are being arranged for. There will be an opening speech by Sir William Ramsay, K.C.B., LL.D., F.R.S.; and at the meeting of the Acetylene Association, on the second day, there will be an address by the President, Mr. F. S. Thorn. Suggested papers should be submitted to the Secretary of the Acetylene Association—Mr. Lacey Downes, of No. 11, Ironmonger Lane, London, E.C.—who will advise the author whether the subject is a suitable one for the congress. The dinner will take place at the Trocadero Restaurant. The morning of each day of the meeting, and the afternoon of the first, will be devoted to the discussion of papers and to demonstrations. On Saturday, May 30, if the weather is fine, there will be a motor-car trip to the residence of Mr. Thorn at Carshalton; and on the Sunday, should a sufficient number of visitors be remaining in England, a picnic on the Thames or a visit to Brighton will be organized.

A NEW TYPE OF GAS-HEATER.

By Edward S. Bradburne.

The gas-heater described in this article is not very expensive to construct. It is economical in gas consumption, and is especially suitable for use in a private motor-house, small greenhouse, or outside workshop.

Fig. 1 is a half sectional elevation of the heating pot, and fig. 2 a view of the general arrangement.

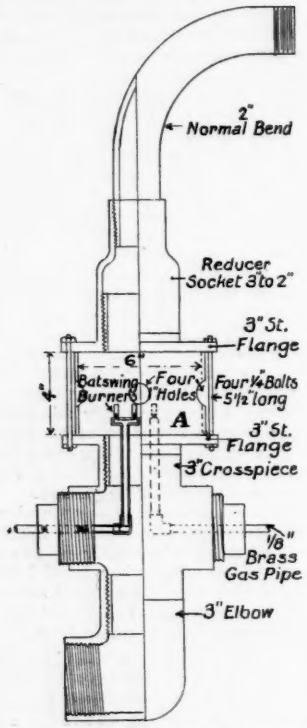


Fig. 1—The Heating Pot and its Connections.

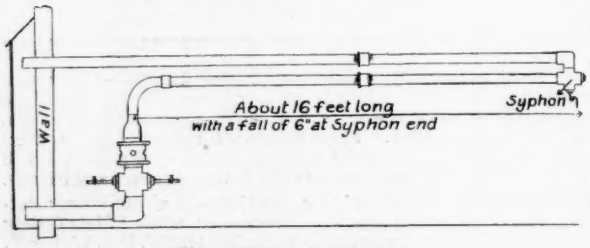


Fig. 2—General Arrangement.

To construct one for a room, say 20 feet long by 12 feet wide and 7 feet to the eaves, the following iron gas-fittings are required, which can be obtained from any gas-tube maker: One 3-inch elbow; three 3-inch nipples; two flanges, each 7½ inches in diameter, for 3-inch iron gas-pipe; one reducing socket, 3 inches to 2 inches; one 2-inch normal bend; one piece of tube, 6 inches external diameter, 4 inches long [this is to have four 1-inch holes drilled in it as shown in fig. 1]; one length of 3-inch pipe 3 feet long to screw into the elbow; one 3-inch cross piece; two 3-inch taper plugs, each to have a hole drilled through the centre, and tapped ¼-inch brass gas-thread; four ¼-inch bolts, each 5½ inches long, with nuts; two batswing burners, No. 4 Bray; two gas-cocks; a small quantity of ⅛-inch brass gas-pipe. All the above are for the heating pot, as shown in fig. 1.

The following are required for the heating pipes: One 2-inch elbow; one 2-inch cross piece; one 2-inch nipple; two 2-inch taper plugs [one of these to be drilled through and tapped ⅛-inch brass gas-thread for the syphon drain pipe]; two lengths of 2-inch pipe, each with a running coupling, and back-nut at the one end, and screwed for a distance of 1½ inches the other end; one piece of 2-inch tube, 11 feet long, with a coupling on one end, and one piece 6 feet long screwed one end only.

It will be noticed, when looking at fig. 2, that the inlet for the air and the outlet for the gas fumes both pass through the same wall, and are covered by a wooden lean-to box. It is essential that the pipes be arranged as shown; if they are fixed in any other manner the apparatus will not work.

It will be seen from fig. 1 that there are three gas-burners in an iron box, two being controlled by one gas-tap and the other by a separate tap. By this means it is possible to have one, two, or three burners alight at the same time.

I must warn readers not to fix bunsen burners on any account; they must be of the batswing type. No doubt some reader will remark, "What about the pipes sooting-up?" There will be no soot formed at all, providing the flame does not touch the iron; and to provide against this, the gas-taps must be provided with stops, so that they can only be turned on enough for a flame, as large as possible, but not large enough to touch the sides of the iron box.

It is very important that the pipes slope downwards to the syphon pipe end; so as to allow the water which collects in the pipes to be drained out. A stove of the dimensions shown in the drawing will fill a bucket in about 50 hours. The ends of the pipes where they come outside the wall of the building should be covered over by a wooden box, with ten 1-inch holes bored at the bottom and ten at the top. If this box is near the window or door of a dwelling house, a ventilation pipe must be run vertically, so as to allow the gas fumes to escape some height from the ground.

There is one very important part of the heater which is not shown in the drawings; and being not very easy to define clearly I will try and describe it. It is very essential that, after the stove is lit, no air should enter except by means of the 3-inch pipe which passes through the wall. Therefore some means must be provided to close the four holes in the pot. After the stove is erected, the pot A must be laid on the bench, with a sheet of tin, 4½ inches wide, long enough to fold round it—the two ends being bent up at right angles and bolted together with two ¼-inch bolts, nuts, and washers. This forms a sleeve which can be rotated round the pot.

Mark with a pencil inside the pot where three of the holes come. Take the tin sleeve off, and bore these holes. Replace the sleeve, so that the three holes coincide with the three holes in the pot. Then move the sleeve round so that the three holes are covered. Mark with a pencil the position of the fourth hole, which must be bored out like the others, and then covered with sheet talc to form a window.

Now place the pot in position with the sleeve on; and, of course, in one certain position of the sleeve the three holes are open for lighting purposes; but when the jets are lit the sleeve is turned round so that all holes are closed, while at the same time the flame can be seen through the window.

The reason for these holes is this: It may happen that there is a very high wind, and if only one hole was provided for lighting, the draught would be so concentrated that it would blow the match out. But by having three holes the pressure is released somewhat. It may happen, however, that the wind is strong enough to blow the lighted match out even with three holes. If so, the only method remaining is to open the door or window of the room and thereby equalize the pressure. This method never fails.

I will now give some figures of the working costs: The workshop where mine is fitted contains 2700 cubic feet, has three outside walls, and no room above. The temperature of the room in the morning is, say, 32° Fahr. Now each burner consumes 5 cubic feet of gas per hour, and is equal to 6° Fahr. At the end of an hour, the temperature has risen to 48° Fahr., and in two hours' time to 60° Fahr. By night time, the temperature will rise higher than this; and if it does, the single burner is turned out. Taking gas at 2s. 6d. per 1000 cubic feet, the cost works out at less than ⅓d. per hour. The thermometer is hung 10 feet away from the stove.

The reason for fitting a 2-inch cross-piece and plug on the end of the lower pipe is to allow (by unscrewing the plug) of the pipe being swept out (say) once in the spring and again in the autumn. If the pipes are painted with aluminium paint, it gives a smart finish. It is, however, no good painting the 2-inch normal bend. The two joints between the pot and the 6-inch flanges must be made air-tight by means of asbestos rings.

According to a leading article in the "Iron and Coal Trades Review" last Friday, the gas-coal owners, at a meeting held on the 20th inst., "reaffirmed their intention of accepting not less than 2s. 6d. advance upon the prices of 1906;" but our contemporary is "informed on good authority that the Gaslight and Coke Company have placed a contract with second hands at a price which leaves about 10s. f.o.b. Newcastle." Referring to the Mines (Eight Hours) Bill, the writer said: "At present it seems that collieries generally are agreed upon the insertion in contracts of an eight-hours clause, entitling sellers to 1s. 6d. per ton advance should the Bill become law; and it is noteworthy that at one of the meetings of colliery owners in London last week, a resolution was passed and forwarded to Mr. Gladstone, pointing out that, contrary to his expressed belief, great inconvenience is being experienced in the trade owing to the uncertainty existing as to the date at which the measure would become operative, should it pass, and suggesting July 1, 1909. The presumption at present is that should the Eight-Hours Bill become law, it would, in the ordinary course of things, take effect as from Jan. 1, 1909, right in the middle of the winter house-coal trade, and during the course of other contracts now being made. The assurance that in no circumstances would the Bill take effect until the middle of next year would do away with the necessity for the eight-hours clause in new contracts, and would greatly tend to facilitate business; buyers protesting even more energetically against the stipulated 1s. 6d. advance than they did the wages clauses last year."

A LARGE WATER-TOWER.

The recent improvements in the water supply system of Louisville (Ky.) include a high-pressure service with a very high steel tank. The Louisville Water Company invited tenders for a steel stand-pipe 50 feet diameter and 220 feet high; but as the water in the lower part of such a structure would not be available for the required service, it was decided that economy of design and convenience of construction would be promoted by replacing the stand-pipe by a tank supported on a tall steel tower—thus eliminating the excessive hydrostatic pressure in the lower part of the structure. This was accordingly done, and the tower has been built as shown in the accompanying illustrations, which, together with the following particulars, are reproduced from a recent number of "Engineering Record."

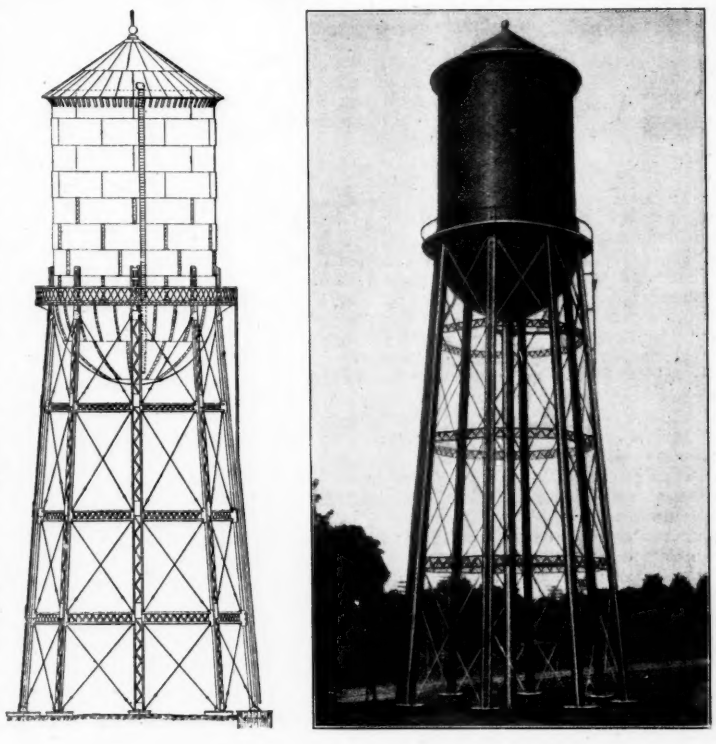
The tank has a capacity of 1,200,000 gallons of water, or equal to a load of 10,000,000 lbs. It is a riveted steel cylinder 50 feet diameter and 65 ft. 4 in. high, with a hemispherical bottom and a conical roof; and it is supported on eight battered riveted steel columns 155 feet high. A vertical riveted steel pipe, 50 inches diameter, is connected to the centre of the bottom and to horizontal mains about 12 feet below the surface of the ground, and serves for both inlet and outlet. The lower part of the tank is surrounded by an annular steel balcony platform and hand-rail, accessible from the ground by steel ladders carried up on one of the tower columns. Another vertical steel ladder extends from the bottom to the top of the tank outside, and affords access through a steel door in the roof to a corresponding inside ladder. The projecting lower edge of the roof forms a sort of cornice around the top of the tank, while an opening through the upper part serves as a ventilator, and is surrounded by a spherical finial and a flag-post extending nearly 40 feet above it. All the columns have separate masonry foundation piers carried down to hard strata, finished on top with short steel cylinders, 10 feet diameter, enclosing the concrete which surrounds the I-beam grillages to distribute the column loads over the masonry.

The columns are proportioned for a maximum static load from combined dead-weight and weight of water of about 1,480,000 lbs. each, which, added to the maximum wind-pressure stresses, serves a total of 1,765,000 lbs., provided for by a gross cross section of 106·4 square inches in the lower sections. They are built in four storeys, and are connected at each by horizontal struts, each set of which makes an octagon. The panels between the columns and the struts in the outer faces of the tower are X-braced with double pairs of sleeve-nut rods, 32 in each storey, varying from 1½ inches square at the top to 1⅞ inches at the bottom. The struts are all light latticed girders, with pairs of angles back to back for the flanges, and single zig-zag angles for the web members. Their depths over all are 30, 36, and 42 inches for the upper, intermediate, and lower sets respectively. Short web plates on both ends are riveted between the flange angles, and extend beyond them vertically to receive the pin connections for the diagonal rods. They also extend beyond the ends of the struts, and are bent to provide field-riveted connections with the webs of the tower columns.

The columns are rectangular in cross section, made throughout with a pair of 24-inch built channels with a 34-inch cover-plate on one flange and the other latticed with zig-zag 3½-inch angles. The inside flanges of the columns are made with 8 in. by 8 in. and the outside flanges with 6 in. by 4 in. angles. The ends of the columns are faced square and are spliced just above the horizontal struts with four single web and flange cover plates. The feet of the lower sections of the columns are faced and are riveted to horizontal ½-inch base-plates, which extend beyond the faces of the columns, and are bent upwards to the angle of the diagonal rod to which they are pin-connected. The base-plates are all of them stiffened by flange connection angles and by short vertical reinforcement angles riveted to the column webs. A pair of short vertical transverse diaphragms inside the foot of the column are riveted to the web plates, and are faced to receive at the upper end a bearing-plate, 1 inch thick, engaging the nut on the upper end of a 3½-inch vertical anchor-rod.

The upper sections of the columns are about 41 ft. 6 in. long over all, and are made regular at their lower ends. About 20 feet above the bottom splice the inner flange angles are bent vertical with their outstanding flanges in the plane of the cylindrical face of the tank. The outer flange angles are similarly bent about 11 feet higher up; and above this bend the inner and outer angles are parallel, and about 13 inches apart. The column flange cover-plate, which is on the inside of the column, terminates about 2 feet below the cylindrical part of the tank, just clearing the hemispherical bottom; and to it and the webs are riveted a pair of 8 in. by 8 in. by ¾ in. angles, 20 feet long, parallel to the main flange angles, and with them receiving the field rivets connecting the columns to the cylindrical part of the tank—312 1-inch rivets at each column. In the tapered part of the column adjacent to its connection with the tank, the channel webs are reinforced by fillers and outside cover-plates; and vertical gusset-plates are riveted to them, forming brackets supporting the balcony platform. This platform, 5 ft. 6 in. wide, is made with full-width floor-plates, ¼ inch thick, stiffened at the inner edge with a 3½ in. by 3½ in. by ⅜ in. curved flange angle field-riveted to the tank. Similar flange angles stiffen the outer edge, and two intermediate radial vertical gusset-plates between each pair of columns divide it into sections about 6 ft. 6 in. long. The hand-rail, 5 feet high, is made of a single 3½-inch flange angle and multiple intersection 1½ in. by ¼ in. diagonal strips.

The tank has eight horizontal courses of curved vertical plates from 96 inches high at the bottom to 102 inches high at the top, with eight plates in each course. The horizontal joints between the courses are telescopic; alternate courses being inside and outside. The horizontal lap joints are all made with a single row of rivets, and the vertical joints in the upper four courses with a lap with two to four vertical rows of rivets. In the lower courses, the plates make vertical butt-joints spliced with inside and outside cover plates having six vertical rows of rivets. The thickness of the course plates varies from 5-16ths inch at the top to 1 inch at the bottom, where the lower edge is reinforced by 13 in. by ½ in. inside and outside cover splice plates, field-riveted to it and to the ¾-inch curved hemispherical bottom plate. The hemispherical bottom is made with two courses of ¾-inch plates, having 24 and 12 pieces in each. Each plate requires two 16½ in. by ½ in. butt straps, with six rows of ⅞-inch rivets—11,480 in all. There is also a bottom plate 10 ft. 9 in. diameter with a flange connection for the vertical inlet and outlet pipe.



A Large Water Tower and Tank at Louisville, U.S.A.

The conical roof has a diameter of 56 feet at the base and a rise of 21 feet to the vertex. It is made with three courses, of overlapping ¼-inch plate secured with ½-inch rivets. In the top course there are four plates curved to an 8-feet radius; in the second course, 16 plates 13 ft. 6 in. long; and in the lower courses, 32 plates 14 feet long. A circular opening, about 28 inches in diameter, at the top of the roof is reinforced by an inside circumferential angle with holes through the outstanding flange to receive 16 ⅝-inch screw rods, forming the lower chords of light triangular trusses to support the roof. The lower ends of these rods are connected to the feet of angle struts normal to the roof, and riveted at their upper ends to a horizontal flange angle at the joint between the second and third courses of roof plates. The feet of the inclined struts are connected by a horizontal circular angle about 26 feet in diameter, which receives 96 screw-end ⅝-inch horizontal radial rods, with their outer extremities passing through the upper edge of the cylindrical walls, and 48 similar rods with their inner ends bolted between a pair of horizontal 3-16th inch spider plates 44½ inches diameter, which receive the foot of the flag-pole. This is 68 feet long, is made with three telescopic sections of gas-pipe 3, 3½, and 4 inches diameter, and is secured at the peak of the roof by horizontal bent plates bolted to it, and riveted to the connecting-ring at that point. The hole in the top of the roof is covered by a conical cap plate 7 inches

vertically above it, with the space between enclosed by cylindrical copper netting, to allow for ventilation and exclude birds, insects, &c. The lower edges of the roof project 34 inches beyond the walls of the cylindrical tank, and are connected to them by 96 curved cornice plates.

The plates for the first course of the cylindrical portion of the tank and those for its hemispherical bottom were completely assembled at the yard in reverse position, making a dome 50 feet in diameter and nearly 60 feet in height. The erection was accomplished by means of a wooden spar nearly 80 feet long, secured at the foot on the ground at the centre of the dome and at the pipe-connection hole, where it passed through the top of the dome. The spar was equipped with four light booms, like those used on sailing boats, which sufficed for handling the separate plates of a maximum weight of 6500 lbs. each, as well as four reaming machines suspended from them with tackles. Two of the machines were of special design made by the Chicago Bridge and Iron Works, and operated by electricity. The other two were Chicago pneumatic reamers, and all were provided with light frames, which maintained the drills in a position radial to the hemispherical plates. With these machines 15,000 holes were accurately reamed, each through about 2 inches of metal. Twist drills were used for the reaming. Outside scaffolds were supported on brackets bolted to the plates to afford platforms for the workmen. Neither the tower nor the upper part of the cylindrical tank was assembled at the shop.

The material for the tower was raised into place with a gin pole with four guy-lines; the pole being moved about adjacent to the position of the eight posts—the anchor-bolts holding the lower sections of the posts in position until connections were made with horizontal struts and diagonal brace-rods. When the first storey of the tower was completed, the gin pole was elevated on to the struts, and the process repeated for each of the eight posts for this and the two upper storeys. Next the horizontal girder was placed in position, and then the lower ring of the cylindrical part of the tank. From these two was suspended the hemispherical bottom. A lighter gin pole was used in placing these parts, as the largest plates only weighed about 8000 lbs., while the main posts weighed upwards of 25,000 lbs. each.

The horizontal girder, the lower ring of the cylindrical part, and the hemispherical bottom were all completely fitted up, pinned, and bolted before any rivets were driven. The upper part of the tank was identical with the usual practice of stand-pipe erection. The rivets were driven by pneumatic power. After the hemispherical bottom of the tank was erected, a temporary platform was built on it, and a stiff-leg derrick placed there, by which the cylindrical tank and roof were erected. The total weight of the structure is about 650 tons, which is pretty well equally distributed between the tower and the tank. It was erected by an average force of twelve men in about 300 days. The tower was built by the Chicago Bridge and Iron-Works Company.

Analysis of comparative designs for a water-tower and a stand-pipe for storing 1,200,000 gallons of water at a minimum height of 155 feet showed that a stand-pipe would cost more than three times as much as the elevated tank and tower for this service. For an average elevation of 50 feet or less, the cost of a stand-pipe and an elevated tank are about equal; for an average elevation of 100 feet, the stand-pipe costs twice as much as the tank; for an average elevation of 150 feet, the stand-pipe costs three times as much as the tank, and so on; being four times as much for 200 feet, five times as much for 250 feet, and six times as much for 300 feet. Of course, for extreme heights, the maximum hydraulic pressure would produce tremendous stresses at the foot of the stand-pipe, making its construction very difficult and costly. It was computed that a stand-pipe 50 feet in diameter and 220 feet high would require metal 2·4 inches thick at the base; thus necessitating two thicknesses of plates.

Sixtieth Anniversary of the French Society of Civil Engineers.—On the 4th inst., the Société des Ingénieurs Civils in Paris had been founded sixty years; and among the members are still five of the original founders, while there are 26 who have been connected with the Society for fifty years or more. On the first three days in May next, special commemorative meetings and a dinner will be held.

Protective Action of Concrete on Iron.—It is pointed out that the fact that iron and steel when embedded in concrete are almost wholly protected against rust is somewhat difficult at first sight to explain, since it might reasonably be expected that the metal would be exposed to oxidation, and this would bring about the speedy disintegration of the mass. Dr. Rohland, in discussing this question in "Stahl und Eisen" for Jan. 29, shows, according to a paragraph in "The Times," that this freedom from oxidation is probably due to physico-chemical causes which prevail during the setting process of the cement and in the early stages of induration. In the first place, the lime present in solid solution in the mass combines with water; but then the colloidal aluminium oxide, together with the colloidal iron hydroxide, and the colloidal silicium oxide are separated from the mortar, and are gradually coagulated by means of the hydroxyl ions. These coagulated substances act much in the same way as a varnish or film, and thus prevent a further penetration of the water into the interior of the cement. By this means a protective action on the iron surfaces against the influence of the oxygen of the air and of the water is secured, and the formation of rust is prevented.

SCOTTISH JUNIOR GAS ASSOCIATION.

WESTERN DISTRICT.

Visit to Messrs. Beardmore and Co.'s Works at Dalmuir.

The Western District of the Association concluded the technical portion of their sessional work last Saturday, by a visit to the Naval Construction Works of Messrs. W. Beardmore and Co., Limited, at Dalmuir, on the banks of the River Clyde some ten miles below Glasgow. The visitors to the number of about fifty, met at the gate of the works, where they were received by Mr. Dunnigan, the Master of Works.

The first place visited was the power station, which has the characteristic feature that its equipment is entirely that of electricity, driven by gas-engines; the gas being made in the works. There is not a steam-engine in all the large establishment, which, it may be mentioned, has a frontage on the river of over a mile in length. The works are new, having been opened in 1904. In the engine-room there are seven gas-engines, on the Oechelhaeuser system, of an aggregate of 5300 B.H.P. There are two of 400 H.P., three of 500 H.P., one of 1000 H.P., and one of 2000 H.P. Such a display of gas-engines is only excelled, in Scotland, by the installation in the Company's engineering works at Parkhead. Two of the engines—the 400 H.P. ones—are used to operate powerful air-compressors, and the others electrical generators, which are of a capacity of 2800 kilowatts; the current being distributed throughout the works by overhead cables, for the driving of machinery.

There are six gas-producers, of the Duff type, capable of gasifying a ton of coal per hour; the coal used being doubles, or dross. The producers are mechanically charged. The coal is tipped from the railway waggons into a large hopper, of 10 tons capacity. It is then elevated and delivered to a push-plate conveyor running along the top of the storage-bins, which have a capacity of about 8 tons; and is discharged into the producers through sliding doors in the bottoms of the storage-bins. The producers are 14 feet diameter inside, and 20 feet in height. Water-lutes at the bottoms of the producers enable the ashes to be drawn off without interfering with the working. The air-blast for the combustion of the fuel is furnished by two Roots blowers, each capable of supplying 12,500 cubic feet of air per minute, at 24-inch water pressure. Each blower is sufficient for the running of all the producers, the other being a stand-by. The air is heated while ascending the tower, down which there passes the water previously used in the process of cooling the gas. About 2½ tons of steam and an equal quantity of air are required for the combustion of every ton of coal. At the bottom of each superheater there is a box for the collection of soot from the gas. From the superheaters, the gas passes into the main, where the process of cleansing it begins; the tar being collected in large pockets. It then passes into a mechanical washer, where it is reduced to a temperature suitable for the recovery of the ammonia. The sulphate of ammonia recovered is from 90 to 100 lbs. per ton of coal. After the extraction of the ammonia, the gas is passed through a cooling tower, meeting with a continuous stream of water, which washes the tar out of it. The gas then enters the main, which conveys it direct to the various furnaces throughout the works; it being used for the firing of two Lancashire boilers and of the furnaces in the platers' shops and smithies. On account of the latter requirement, the gas-producing plant is worked under pressure. Before being used for the driving of engines, the gas is subjected to a still further cleaning, by being passed, in the first place, through an auxiliary cooling chamber, and, in the second place, through cleaning-fans, three of which are provided, each capable of dealing with 360,000 cubic feet of gas per hour, and which are arranged so as to be worked in series or parallel. The last trace of tar is removed in sawdust scrubbers, after which the gas enters the main that serves the power-house. The arrangement and equipment of these extensive works have been found to result in great economy; and the gas heating of the furnaces enables very much finer work to be done than is the case where coal is employed.

After leaving the gas-works, the visitors were taken through the marine engineering shop (where many fine tools were seen), the blacksmiths' and joiners' shops, the fire station, the cabinet-making works, and the platers' shop. They finally had a look at a fine vessel of 20,500 tons which the Company have built.

In the course of the inspection, the President (Mr. W. Wilson, of Falkirk) proposed a hearty vote of thanks to the Company for allowing their magnificent works to be visited, and likewise to the gentlemen who had shown them what they had seen; and it was at once accorded.

London Gas Coal Supplies.—In the quotation from the "Iron and Coal Trades Review" that appeared in the "JOURNAL" for March 17 (p. 696), these words appeared: "While Sir George Livesey publicly ridicules the suggestion of 10s. for best Newcastle gas qualities, the Commercial Gas Company are reported to be offering 9s. 9d. to 10s., as against colliery prices of 10s. 3d. to 10s. 9d." We understand that the latter part of this statement is entirely without foundation; and it is well that a misleading announcement of this kind should not be allowed to exert any influence elsewhere.

ARTIFICIAL LIGHTING AND EYESIGHT.

In the last number of the "Revue Électrique," reference is made to some investigations carried out by Herren F. Schanz and C. Stockhausen into the effect of artificial lighting on the eyesight. They came to the conclusion that eye-troubles are caused by the ultra-violet rays emitted by light sources, and also by their brilliancy. The former, especially those of the electric arc, first cause inflammation, afterwards a disorder of the crystalline lens, and finally premature fatigue of the eye. In the pursuit of their inquiries, they found that lamp-glasses are good absorbers of the ultra-violet rays of which the wave-length is less than 300 micro-millimetres; but that they are very permeable to those of from 300 to 400 micro-millimetres, which are the most injurious. The authors remark that all our sources of artificial light, more especially the modern electric and gas lamps, contain an enormous proportion of ultra-violet rays; and therefore it is advisable to "filter" the light coming from these sources through glass which is absolutely impermeable to these rays. They succeeded in manufacturing such a glass.

When the action of the visible rays is studied, it can be easily understood that the brilliancy which is so injurious depends upon the brightness of the light. The power should not exceed 0·75 Hefner unit (0·68 candle) per square centimetre (0·155 square inch). Wax candles, oil-lamps, batswing gas and petroleum burners, are characterized by a brightness which does not exceed the prescribed limits. All the other sources of light, on the contrary, are excessively brilliant, and dazzle the eye; the round petroleum burner being one of the most injurious in this respect. Incandescent mantles, lamps with metallic filaments, and especially Nernst and arc electric lamps, possess enormous brightness; and consequently they should be enclosed in very dispersive glass globes. Thus the brightness of the Nernst lamp is 550 times, and that of the arc lamp 4000 times, too great. As the result of an examination of the globes obtained in commerce, the authors noted that many of them had insufficient opacity, the result of which was a brightness two or three times greater than the normal or hygienic degree. They consider that transparent globes should be banished, and opal ones, very uniformly opaque, employed; and they regard indirect lighting by reflection on the ceiling as the ideal system.

It is useful to be able to distinguish, by the aid of a chemical reagent, whether or not a source of light emits ultra-violet rays; and therefore the following recipe, given in a recent number of "Cosmos," may be of interest. Paper saturated with a solution of *p*-phenylene-diamine has the property of turning blue under the action of ultra-violet rays. This paper can be handled in daylight without appreciable change. In diffused light it merely acquires a light grey tint. Exposed to the rays of a quartz glass Heræus lamp, it immediately turns blue. If a rather thick piece of ordinary glass is interposed, the coloration ceases to appear. To prepare this paper, one gramme of the product is dissolved in 14 c.c. of water mixed with 4 c.c. of dilute nitric acid (in the proportion of 2 parts of acid to 3 parts of water). The saturated paper is dried quickly by heat, and must be used immediately.

MAINTAINING EFFICIENCY IN GAS APPLIANCES.

At the last Meeting of the National Commercial Gas Association of America, a paper dealing with the question of how far a gas company should go to maintain the efficiency of gas appliances was submitted by Mr. J. C. D. Clark. In the course of it, he put forward the following suggestions for consideration.

The National Commercial Gas Association to recommend to the American Gas Institute the appointment of a Committee (composed of three members of the Association and a like number of members of the Institute) to devise a way or means towards the installation of a permanent testing laboratory, where all gas appliances coming on the market might be thoroughly tested by competent men, to be known as the "Board of Gas Appliance Examiners." It would be proper for them to give, in pamphlet form, their recommendations regarding the installation and operation of the appliances tested by them, and, so far as possible, let the pamphlet accompany the appliance. It could be got up in such a manner as to be acceptable to manufacturers and those concerned in its sale. The pamphlet would serve as an educator to the salesmen, the installer, and the customer. The Board could in time establish a standard for all gas-burning appliances. Their work would go a long way towards encouraging the manufacturer inclined to build good appliances, and would tend to discourage the sale of worthless ones. The Board should compile an illustrated pamphlet or book, showing, by simple diagrams, &c., the principles involved in the use of gas, the precautions necessary to secure the best results and to maintain them, and giving a brief and effective statement as to the advantages of gas over all other sources of heat and light. Every gas user should be provided with a copy; and, if possible, a monthly pamphlet should be issued. It seems to me that such a distribution of knowledge would more than repay the cost of publication, &c., in the increased satisfaction of the customer, who now blames the gas for all the trouble he has with a gas appliance the operation of which he only half understands.

Gas companies should co-operate with the Gas Associations by bearing part of the expense of the Board of Gas Appliance Examiners; purchase from the Board such pamphlets as are published, and place one in the hands of each gas user; purchase only such appliances as are approved by the Board; connect all appliances in accordance with instructions accompanying them (unless local conditions interfere); employ competent mechanics to instal all appliances; instruct their customers how to operate, clean, or adjust the appliance installed for them, also educate the customer to know the signs of poor combustion, draught, &c.; make a systematic inspection of all gas-burning appliances that are connected on their lines to ensure safety, hygienic conditions, and efficiency; and establish a maintenance department for the purpose of maintaining such appliances as need regular and constant attention to maintain efficiency, charging such fees as seem fair for the service rendered.

It has always been a problem with gas companies to keep a sufficient number of good mechanics at work all the year round. When the work is slack mechanics are sent off, and take up other employment; then a "green" man has to be broken in when a busy time comes on. I would recommend that the commercial department so plan this work that the mechanical department is kept busy all the year round, and that during August of each year the town should be divided into sections, and all the mechanics that can be spared started on a house-to-house inspection of appliances, to clean and adjust fuel appliances, clean or renew flat-flame burners, and clean, adjust, or renew mantle burners—no charge to be made for cleaning or adjusting appliances. Charge only for the material used; and at the time the inspection is made, arrange with the customer for the regular inspection—say, once a month—charging a nominal fee to cover the cost of labour and material. In this way, you will be as far as possible in control of the customers' appliances.

A Gas-Driven Blowing-Engine.—According to a paragraph in the "Financial News," the blowing-engine which has been installed at the new iron-works which are being equipped by Sir Alfred Hickman at Springvale, Wolverhampton, is said to be the largest in the country. It is driven by a gas-engine, and was made by the Premier Gas-Engine Company. The gas and air cylinders are at right angles; the latter being vertical. There are four gas-cylinders, two pairs placed in tandem, all measuring 39 inches diameter by 4-feet stroke. Each pair of cylinders has twin connecting-rods working on one crank. Each of the two blowing cylinders is 79 inches diameter by 4-feet stroke. They are fitted with mechanically-operated valves, and are capable of delivering 40,000 cubic feet of free air per minute. The two cranks are set opposite, so that all the reciprocating parts are balanced; and a heavy fly-wheel is fitted on one end of the crank-shaft. The engine occupies a floor-space of 43 ft. 6 in. by 26 ft. 9 in., and runs at any speed between 50 and 85 revolutions per minute.

Detecting Waste of Water by the Pitometer.—In the "Journal" for the 28th of January (p. 238), we gave an illustrated description of the pitometer—an instrument employed for detecting and recording waste of water. In the course of the article, it was mentioned that in Washington a permanent department had been established for the systematic detection of waste; and we now learn, from "Engineering Record," that in the city surveys are carried out by a special force of seven men and two horses and waggons, with five pitometers having photographic recorders. The work is done by dividing the area under investigation into comparatively small districts, each of which can be supplied by a single main, placing a permanent pitometer connection on this main, and measuring the flow of water by the regular method when this instrument is employed. By successively cutting off the several parts of the small district, the amount of water flowing to these parts is ascertained, and by continuing the process waste and leaks are located and measured. The work was organized early in the last fiscal year, and during that period checked the waste of 914,000 gallons of water daily, at a total expense of $10,600 for all labour and materials.

Increasing the Efficiency of Sand Filters.—A French patent has been taken out by M. Pennink for an improved process for increasing the efficiency of sand filters. According to an abstract of the specification which appears in the "Journal of the Society of Chemical Industry," the upper surface of the sand is covered with a cloth made of ramie, or other suitable material, which is fastened to the sides of the filter-tank, and has a central orifice, the edges of which hang down freely into the upper end of a vertical pipe which passes through the filter and is provided with a valve. When working normally, this valve is closed, and the liquid to be filtered is delivered into the open top of the tank, passes through the cloth and the sand, and flows away through pipes which are embedded in the sand and pass through the sides of the filter-tank. The fine detritus which forms the real filtering medium collects on, in the interstices of, and just below the cloth; and when this deposit has accumulated to such an extent as to impede the filtration, it is removed by opening the valve on the vertical pipe, when the water above the cloth flows rapidly away, carrying the deposit with it. If necessary, the deposit in the upper layers of sand and within the interstices of the fabric itself may be removed by introducing water through pipes which are embedded in the sand three-fourths of the distance from the bottom. Further, the cloth may be removed, and after being cleansed be replaced.

REGISTER OF PATENTS.

Recording Meter Readings.

HAWKINS, G. E., of Columbus, Ohio, U.S.A.

Nos. 9912 and 9913; April 29, 1907. Date claimed under International Convention, May 4, 1906.

These inventions relate to a device for recording the readings of meters, and have for their object the provision of means in connection with the recording mechanism of gas or water meters for obtaining an exact copy in duplicate of the position of each of the hands of the recording mechanism at the time the record was taken.

The patentee produces a "manifold" sheet, having portions of its surface carboned, and having facsimiles of the dials of the meters arranged upon either of its surfaces in such manner that the sheet, when folded, will present upon its outer surface a facsimile of the dial-plate of the meter. The figures upon the facsimile are made backwards; while those upon the dials placed upon the other portions of the sheet are arranged in the usual way. So that, when the sheet is used in connection with mechanism described in the second patent, the meter hands will make marks upon the record sheet indicative of their position at the time the reading of the meter was taken—the marks lying across the faces of the dials printed upon the meter slip.

The object of the inventions is to produce records of the readings in duplicate, so arranged that one of the records may be left with the householder and the other turned into the company's office to be filed after the bills have been made up from it. A further object is the provision of mechanism which renders it possible to obtain the duplicate records without the use of inking mechanism, as it has been found that where the hands of the recording mechanism of the meter have been inked, the ink in the course of time clogs the hands, producing blurred impressions and interfering with the proper working of the meter.

Distilling Coal for the Manufacture of Coke and Production of Gas.

SHELDON, S. B., of Buffalo, New York.

No. 21,808; Oct. 2, 1907. Date claimed under International Convention, Oct. 2, 1906.

This invention consists more especially in a process for effecting the coking or distillation of coal, and at the same time saving the gases produced in the operation, in order that the gases may be utilized for heating or other purposes, and bye-products be recovered.

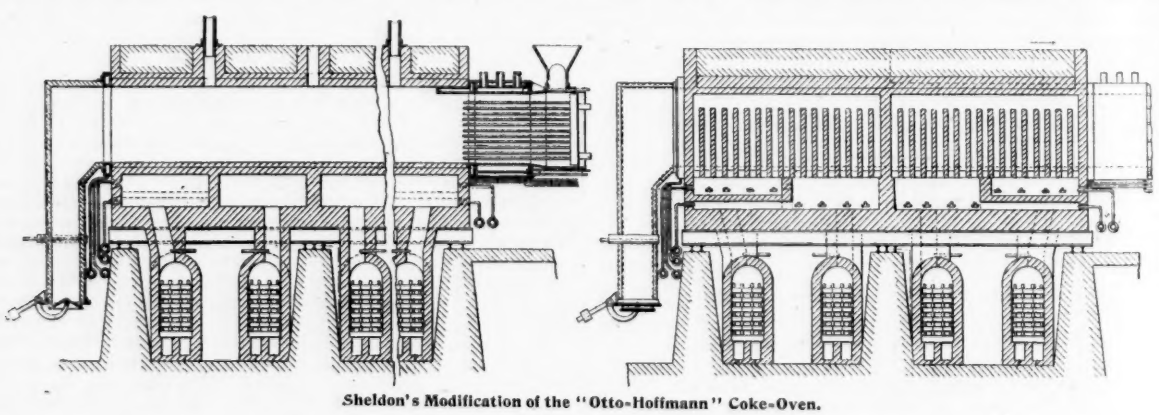
In the drawings accompanying the specification apparatus adapted for carrying out the invention is illustrated, embracing general features of construction as follows: For effecting the coking or distillation of the coal, a coking oven is employed of the kind generally known as a "bye-product" oven—that is, an oven in which the coal, during the coking operation, is contained within a closed chamber, and is subjected to the action of heat transmitted to it through the walls of the chamber. The type of oven preferred is that known as the "Otto-Hoffmann" oven, in which the coking-chamber is arranged horizontally (or is horizontally elongated) and adapted for the introduction of coal at one end, and for the discharge of the coke from the opposite end; the coal during the coking operation being advanced along, or through, the oven, which is closed against access of outside air and is provided with delivery passages, through which pass the gases produced during the coking operation.

The oven illustrated consists of two sections, arranged end to end to form a continuous coking chamber; the sections being provided with separate or independently controllable means for effecting the heating, so that the section of the oven into which the coal is first introduced can be maintained at a higher temperature than that at which the section adjacent to the discharge end of the oven is maintained.

In connection with the oven, at the receiving end are means for forcing the coal into and through the oven; means for compressing the coal preparatory to its introduction into the oven; and means for preheating the coal after it is compressed and before it enters the oven. The coal-feeding, compressing, and preheating means embrace generally a receiving chamber, a preheating chamber, and a tapered passage connecting the receiving chamber and preheating chamber, and larger at its receiving end than at its delivery end. The receiving chamber, tapered passage, and preheating chamber are connected with each other so as to constitute a continuous passage, which, at the delivery end of the preheating chamber, opens into the receiving end of the oven.

The receiving chamber is provided at the top with an opening, through which the coal is introduced, and in which is a horizontally reciprocating plunger, which, in its advance movements, forces the charges of coal introduced into the chamber through the tapered passage and the preheating chamber into the coking chamber. The inclined or tapered sides of the passage constitute, in conjunction with the plunger, the means for compressing the coal; the sides serving to effect compression of the coal laterally, or from the outside towards the centre of the mass of coal, as it is forced through the passage by the action of the plunger. The walls of the preheating chamber (preferably made of comparatively thin metal) are surrounded by a combustion chamber, in which gaseous or other fuel is burned; the heat produced being transmitted through the walls to the coal within the chamber.

The compacted mass of coal which enters the preheating chamber from the tapered passage in which it is compressed, is subjected, in its passage through the preheating chamber, to any desired degree of heat. Within the passage formed by the receiving chamber, the tapered passage, and the preheating chamber, metal rods are arranged parallel with the path of the coal and projecting from the inner face of the plunger. These rods form continuous perforations or channels longitudinally through the compressed mass of coal, as the mass is advanced towards, and into, the oven; the coal being compressed between or around the rods in the advance movements of the plunger, and the rods extending such a distance towards or into the oven that the longitudinal passages or perforations formed by the action of the rods will not be closed by lateral pressure on the mass of coal after the mass passes the free or advance ends of the rods. The passages or perforations so formed in the mass of coal by the rods are said to serve to facilitate the escape of gases and volatile matters from the coal, and to thereby aid in the coking operation, while giving more uniform results in the coking of the mass, especially in the mid part of it. At the discharge end of the coking chamber, means are provided for permitting the discharge of coke without the admission of air—such means preferably consisting of a depending delivery pipe or passage provided with two valves, only one of which is opened at a time during the discharge of the coke.



Sheldon's Modification of the "Otto-Hoffmann" Coke-Oven.

The operation of the apparatus is practically continuous in carrying out the process; and the coking or distilling operation takes place without the admission of external air to the oven. The entrance of air to the receiving end of the oven is prevented by the solid mass of compressed coal which fills the tapered compressing passage and the preheating chamber; and access of air into the delivery end of the oven is prevented by the double valves in the discharge duct. The compressed and preheated mass of coal is advanced from the preheating chamber into the oven by an intermittent or step-by-step movement produced by the reciprocation of the feeding and compressing plunger; and the mass is advanced along or through the oven as the coking operation takes place—the gases generated being withdrawn continuously from the coking chamber.

When the coking chamber is made in parts or sections, it is intended that the coking operation shall take place mainly in the section in which the coal is received, or that adjacent to the receiving end of the oven; and the section adjacent to the delivery end of the oven is maintained at a lower temperature, so that a partial cooling of the mass of coke will take place before its discharge from the oven.

Tar Spreading for Roads.

METCALF, J. W., of Newmarket.

No. 8623; April 13, 1907.

This tar-spreading apparatus for roads, pavements, and the like, consists of a boiler of circular or oblong shape (any suitable capacity from 25 up to 300 gallons). To the outlet cock of the boiler is attached the tar distributing and spreading apparatus, which consists of a supply pipe carried down close to the ground and feeding the tar or liquid into the delivery tube. In the delivery tube are a number of outlets through which the tar flows, either directly or indirectly, on to the road. In some cases these outlets are arranged as a double row of holes—one set alternating with the other, so as to ensure fair distribution. In some cases, there may be a single row of holes, comparatively few in number, and to each hole may be fitted a short tube, flattened out into the shape of a fantail at the rear end, upon which the liquid spreads itself as it flows out of the tube. Each fantail touches (or almost touches) its neighbour on either side—thus forming a practically continuous edge from which the tar drips; and in order to ensure more uniform distribution, there is interposed a perforated strip underneath these flattened outlets—the tar flowing through the

perforations, or overflowing the edge of the strip, which may be upturned or flanged.

Metcalf's Tar-Spreading Machine.

The tar is worked into the road by brushes attached to the machine and drawn along just behind the distributor. The bracket on which the brushes are fixed may be so constructed that they can be lifted up and held off the road when not in use. For this purpose, the brushes are attached to arms; and these are fixed to a cross-bar held in brackets attached to any suitable part of the machine, so that it may turn therein. The brushes are preferably arranged so as to overlap one another when working the tar into the road.

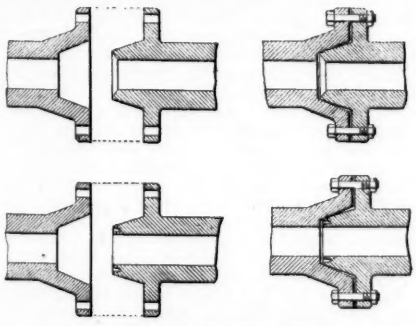
Pipe-Couplings.

SCHMIDT, C. R., of Baltimore, U.S.A.

No. 9916; April 29, 1907.

This invention relates particularly to couplings for cast-iron pipes of the faucet-and-spigot type, wherein the faucet and spigot ends of adjacent sections are tapered and machined or ground to produce a tight joint.

In couplings of this kind, it has been customary to form the external surface of the spigot end and the internal surface of the faucet end on the same taper. Theoretically, the patentee points out, this should produce a perfectly tight joint; but it has been found that the constant wear of the tools employed in machining the joint sections, the expansion and contraction of the metal of which the sections are formed, and other causes, render many of such joints liable to leak, and if made tight at all they are only made so by excessive strain, which often bursts the faucet end. Another defect quite common in couplings of the faucet-and-spigot type, is that the meeting parts not being perfectly jointed, so as to afford a considerable area of contact surfaces, corrosion from chemical or electrolytic action results, and the joint is rendered leaky. Another objectionable feature of this type of joint is that the several sections must, in order to secure a reasonably tight joint, be arranged with their longitudinal axes in absolute alignment.



Schmidt's Pipe-Couplings.

In carrying his present invention into effect, one of the ends of each pipe section, preferably the spigot end, is so formed that it will possess sufficient elasticity to yield somewhat under the stress of the connecting devices and provide a tight joint, whether or not the meeting ends are perfectly machined or ground and permit of the sections being laid at somewhat of an angle to one another, and also provide surface-contact of considerable area, "so as to secure good electrical conductivity at the joint."

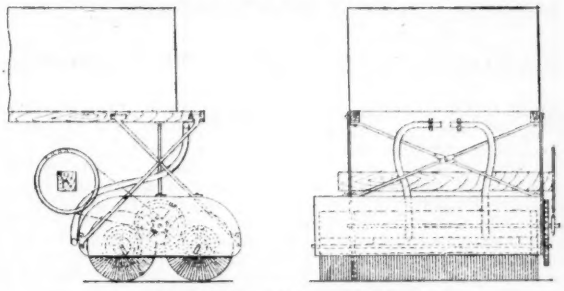
Two typical forms of such joints are shown—with the faucet and spigot ends separated to show the construction of each; as also the same sections jointed together.

Applying Tar to Road Surfaces.

REESON, J. N., of Beckton, E.

No. 11,623; May 17, 1907.

This invention relates to a machine for applying tar to road surfaces, comprising brushes mounted on spindles in a frame placed at right angles to the line of travel of the vehicle, or inclined thereto, and rotated by chain or gear wheels or the like driven by chain, belt, or other gearing, either from the wheels of the tank vehicle to which the machine is attached, or from the road wheels supporting the machine itself; the arrangement being such that the spreading of the tar over the road surface is effected solely by the brushes.



Reeson's Road-Tarring Machine.

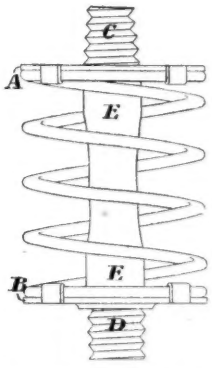
The part of the arrangement specially shown is quite independent of the tank vehicle, which contains the tar, and may be attached to the vehicle (an ordinary water-cart or the like) by a draw-bar or other suitable arrangement. The spindles on which the brushes are mounted are jointed in such a manner, and in so many sections, that the brushes adapt themselves to the contour of the road surface. The arrangement for distributing the tar is placed in front of, or upon, the brushes, and is attached to the tank vehicle by flexible or other suitable pipes provided with valves or cocks through which the tar is delivered from the tank to the distributing arrangement proper.

Anti-Vibration Device for Incandescent Burners.

WILLS, E. D., and KNOTT, F., of Ashton-under-Lyne.

No. 13,343; June 8, 1907.

This anti-vibration device has rigid end connections for the burner and gas supply pipe respectively, and a flexible medium between the two rigid connections.



Wills and Knott's Anti-Vibrator for Burners

A B are sheet-metal plates or discs; the former being provided with a connection C for screwing into the gas-supply pipe, while B has a similar screw D for the burner device. To the inner faces of the discs are secured the ends of a flexible tube E. The discs are also provided with projecting lugs F bent over to embrace the end ring of a single spiral spring, holding the discs apart, and acting as a resilient medium. The spring is sufficiently large to correspond with the diameter of the discs, so that while allowing for axial resiliency, lateral resiliency may also be provided for, with the object of absorbing vibration of the gas-fittings.

APPLICATIONS FOR LETTERS PATENT.

5787.—BROWN, F., "Producer Gas furnaces." March 16.

5793.—ROSIE, J., and M'KELVIE, J., "Automatically lighting and extinguishing gas-lights by varying the pressure in the mains." March 16.

5798.—HUNT, W., "Condensers." March 16.

5809.—HARTLEY, J., "Mantle ring and burner nozzle." March 16.

5833.—SHAW, E. J., "Inverted burners." March 16.

5848.—HARRISON, C. W., "Incandescent burners." March 16.

5861.—MELHUISH, A. G., "Gas-blowers." March 16.

5936.—CUTLER, H. A., "Controlling the discharge of water from reservoirs." March 17.

5983.—COOPER, J., "Gas-producer." March 18.

6011.—GARDNER, J. A., "Liquid meter." March 18.

6024.—LEEVERS, F. W., "Stop and through-way valves." March 18.

6026.—ROSS, E., "Manufacturing Mantles." March 18.

6056.—HOBBS, H. T., and COUCH, R. H., "Controlling and economizing gas." March 18.

6062.—CONTINENTAL CAOUTCHOUC UND GUTTA-PERCHA COMPAGNIE, "Pressure-reducing device." March 18.

6092.—LINTON, E., and REID, D. S., "Rapid cooker, gas economizer, and heat increaser combined." March 19.

6099.—ROSS, J. H., "Purifier and condenser for acetylene gas." March 19.

6109.—TOURTEL, J. M., "Controlling gas-lights." March 19.

6161.—THORNTON, H., "Bye-pass devices." March 19.

6191.—KING, J., and WORKMAN, H., "Gas-producer." March 20.

6204.—STEWART, J., "Gas-producers." March 20.

6218.—BRITISH CYANIDES COMPANY, LTD., and CHANCE, K. M., "Manufacture of sulpho-cyanides." March 20.

CORRESPONDENCE.

[We are not responsible for opinions expressed by Correspondents.]

METALLIC FILAMENT LAMPS IN STREET LIGHTING.

A correspondent writes: "In the 'Electricity Supply Memoranda' in the current issue of the 'JOURNAL,' I note the reference to metallic filament lamps for street lighting at Brighton. I fancy the writer has fallen into the natural error of thinking the lamps in question were Osram; but, if I have read the notice correctly, it is for two 16-candle power metallic filament lamps, which evidently refers to the new Tantalum lamps, sold at 2s. 6d. each, for use on any circuit in any position. Osrams are not made at this low candle-power, except for very low-voltage circuits. The side street lighting at Brighton has been a case of 'darkness made visible' for some years. In most cases, each electric lamp is fitted up with two 8-candle glow lamps and a reflector, the charge being given at 54s. 5d. per annum; with two 16-candle glow lamps, at 82s. 8d. per annum. Now, of course, the estimate has been trimmed to meet the charge for incandescent gas-lamps elsewhere in the town; but it is amusing to find how our electrical friends (including the makers of the Osram lamp) are trying to persuade all concerned that the lighting value of an ordinary incandescent burner, as maintained by gas companies in the public lamps, is represented by an equivalent of 30 candles."

Another correspondent writes: "I note in the 'Electricity Supply Memoranda' of this week's 'JOURNAL,' you remark upon the prices that are being quoted for street lighting by Osram lamps; and I think you will be interested to know that we are suffering under the same competition. I find that street lighting by a pair of Osram lamps (nominal total candle power 66) is being done at £2 15s. per annum, against our £3 4s. for a 'C' incandescent gas-burner; whereas reckoning current at the price charged for other public lighting, I cannot see how it can be done under £3 12s. 6d. And not only that, but the Council are given to understand that these lamps give about four times the effective illumination of a 'C' gas-burner. One street is lighted by pairs of Tantalum electric lamps (46-candle power nominal) at £1 17s. 3d. per annum (no charges for interest, depreciation, &c., are included in this figure), while I believe a fair charge would be about £4. Under these circumstances, you will understand that we are getting very little lighting in new streets, though I believe the electricity prices are only to obtain a foothold, and the eyes of the Council will be opened in the future. Failures of electricity here are a fairly frequent occurrence, and are giving us custom with private consumers. Still more fuss, however, is made over one street gas-lamp if it should be out, than over a complete failure of electricity."

Gas and Electricity Purchase Question at Altrincham.

At a special meeting last Tuesday, the Altrincham Urban District Council considered the proceedings of a conference representing the three Local Authorities of Altrincham, Bowdon, and Hale, appointed for drawing up a scheme for the acquisition of the Altrincham Gas Company's property, and that of the Altrincham Electric Supply Company, Limited, on the basis of joint and mutual ownership, and the creation of a Joint Board of Management. The report showed that an offer of £190,000 had been made to the Altrincham Gas Company for their undertaking, with a further £2000 as compensation to the Directors and Secretary for loss of salary. This amount, however, was regarded as inadequate; and the Directors intimated that the shareholders had authorized them to negotiate at a price of not less than £200,000. In these circumstances, the conference recommended the respective Councils not to take any further steps. Mr. Birtles supported the decision of the conference; and Mr. M'Cann regretted the Gas Company had not shown a greater sense of local patriotism. On the motion of Mr. Hughes, who urged that the negotiations should not be closed, an amendment was carried disapproving of the report—thus leaving the matter open for further negotiation. The Council approved of the action of the conference in arranging for a valuation of the Altrincham Electric Supply Company's undertaking.

Gas Companies and Ironmongers.

In accordance with the decision come to at the last meeting of the London Ironmongers' Association (see *ante*, p. 785), a deputation waited upon the Engineer of the Brentford Gas Company (Mr. A. A. Johnston) last Tuesday, for the purpose of laying before him their views regarding the policy of the Company in opening show-rooms in their district. Mr. R. H. Smith, who introduced the deputation, stated that if the Company were determined to sell fittings and appliances at practically cost price, they would cause serious injury to the established traders of the district, and therefore the meeting had been arranged for the purpose of expressing the hope that satisfactory working arrangements could be entered into between the Company and the ironmongery trade, upon lines somewhat similar to those followed in various other districts in the country, the latest of which was the arrangement come to with the South Metropolitan Gas Company. He added that the ironmongers whom they represented did not desire to appear to be dictating to the Company. He placed before Mr. Johnston copies of the arrangements which had been made between certain gas companies and the local hardware trade. Other members of the deputation having spoken, Mr. Johnston expressed his thanks to them for laying before him the views of the trade that they were connected with, and stated that he did not see why satisfactory working arrangements could not be arrived at. His Company had no desire to injure the ironmongery trade; and they would aim at bringing about a satisfactory arrangement. Some discussion took place in regard to the terms of such an arrangement, and the deputation withdrew. Another meeting is to be held shortly, at which it is hoped a satisfactory conclusion will be arrived at.

PARLIAMENTARY INTELLIGENCE.

HOUSE OF LORDS.

The following further progress has been made with Bills:—

Bills brought from the Commons, read the first time, and referred to the Examiners: Conway and Colwyn Bay Joint Water Board Bill, Derby Gas Bill, Rochdale Corporation Bill, Stockport Corporation Bill.

Bills reported, with amendments: Audenshaw Urban District Council Bill, Briton Ferry Urban District Council Bill, Llanelly Gas Bill, Pontypridd Water Bill, Skegness Urban District Council Bill.

Bill read the third time and passed; Briton Ferry Urban District Council Bill.

HOUSE OF COMMONS.

The following further progress has been made with Bills:—

Bill brought from the Lords, read the first time, and referred to the Examiners: Briton Ferry Urban District Council Bill.

Bill read a second time and committed: Camborne Water Bill.

Bills reported, with amendments: Bromley and Crays Gas Bill, Dartford Gas Bill, Draycott Gas Bill, Wolverhampton Corporation Bill.

Bills read the third time and passed: Conway and Colwyn Bay Joint Water Board Bill, Derby Gas Bill, Rochdale Corporation Bill, Stockport Corporation Bill.

DRAYCOTT GAS BILL.

House of Commons Committee.—Monday, March 23.

(*Before Mr.* WHITBREAD, *Chairman*, *Major* RATCLIFF, *Mr.* LYNCH, *and Mr.* WALTER REA.)

The chief objects sought by the Bill promoted by the Draycott Gas Company are to repeal certain powers of the Long Eaton Gas Company, to extend their limits of supply, to provide for the purchase, by agreement, of the Castle Donington Gas and Coke Company, Limited, and to enable the Draycott Company to manufacture gas on certain scheduled lands, to purchase land by agreement, to convert existing capital, to provide for a renewal fund, and for authority to reduce the illuminating power from 15 to 14 candles, and modernize the testing arrangements.

Mr. HONORATUS LLOYD, K.C., Mr. G. J. TALBOT, K.C., and Mr. R. S. CLEASE appeared for the promoters; while the only petitioners in opposition, the Long Eaton Gas Company, were represented by Mr. BALFOUR BROWNE, K.C., Mr. FITZGERALD, K.C., and Mr. C. C. HUTCHINSON.

Mr. HONORATUS LLOYD, in opening, said the only matter with which the Committee would be troubled at any length was the proposal to repeal certain powers of the Long Eaton Gas Company; and there might be a little discussion as to a portion of the area which the promoters sought to include within their district. The other proposals were all unopposed. In 1864, the Long Eaton Gas Company was formed, with the object of supplying gas to Long Eaton and various places adjoining; and in 1880 they obtained a Provisional Order. The Company did considerable work in the way of supplying in the neighbourhood of Long Eaton; but they did not extend into the area of the Draycott Company until about 27 years after they received authority to do so. In 1887, a great desire for a supply of gas in Draycott and Breaston was manifested; and the Long Eaton Company—the only Company then existing with power to supply there—were requested to extend their mains to these places. They, however, replied that it would not pay them to do so. The people thereupon set to work to see how they could obtain a supply for themselves. Mr. E. T. Hooley, who was then very active in the neighbourhood, having considerable interest in it, endeavoured to obtain a supply from the Long Eaton Company for some mills in which he was concerned. Failing in this endeavour, he constructed gas-works for himself, and formed a small limited liability Company to carry on the undertaking. He agreed to sell the enterprise; and in 1888 an application was made to Parliament for authority to form a statutory Company, to be called the Draycott Gas Company. In the notice of their intention to apply for the Bill, it was intimated that Parliament would be asked to repeal the Long Eaton Company's powers in the area in which the new Company proposed to supply. The Long Eaton Company stated that if this portion of the Bill was pushed, they would object. The promoters, feeling that they need not enter on a discussion as to whether a portion of the Long Eaton Company's powers should be repealed, put nothing in their Bill relating to the point. In this way, power to supply as a statutory concern was obtained by the Draycott Company. In 1896, the Company—who until then had done very little business—was reconstituted; and its directorate fell into the hands of gentlemen who were very capable of dealing with a gas undertaking on proper lines. The result was that the undertaking grew and grew until it became the successful business it now was, earning as it proceeded the praise of all to whom it supplied gas. In 1901, the Long Eaton Company applied to Parliament for a Bill. At that time there were negotiations between the two Companies with a view to seeing if they could not district the area between them; it being well known to both that Parliament did not, in modern times, give competitive powers to gas companies, and that both Companies had concurrent powers in the area of supply of the Draycott Company. The Draycott Company thought, however, that the Long Eaton Company were not meeting them in the spirit in which they ought, and

negotiations were broken off; the Draycott Company determining to oppose the Bill of the Long Eaton Company. When, however, they sought to present a petition against the Bill, the promoters objected to their *locus standi*; pointing out that they were merely asking for additional capital powers, that the existing Acts provided for the exercise of concurrent powers, and that they did not seek to alter any of these Acts. The Court of Referees upheld the objection, with the result that the Long Eaton Company obtained their Act, and the Draycott Company were not heard with respect to it. The Act established a sliding-scale, and provided for a standard price of 5s. 2d. per 1000 cubic feet in Long Eaton itself, and of 6s. 2d. outside.

Mr. HUTCHINSON remarked that the Act continued the sliding-scale of the Provisional Order.

Mr. HONORATUS LLOYD, resuming, said the main point was that a difference of 1s. was recognized by the Company and by Parliament. Since 1901, the Draycott Company had continued to give an excellent supply, and with a clean sheet. The mains of the two Companies drew nearer and nearer to each other, and about the year 1905 the Long Eaton Company—who, at that time, had not a main within about a mile of the Draycott Company's district—made an arrangement with the Long Eaton Estate Company, who were then building some houses in the Draycott area, and laid two short lengths of isolated main in the Draycott district. Last year the Long Eaton Company made up their minds apparently for a grand invasion of the Draycott area, and they employed some extraordinary manœuvres. They offered to supply gas in the Draycott area at 2s. per 1000 cubic feet, although in Long Eaton itself, close to their own works and under the most favourable conditions, they were supplying at prices which, with discounts, even for a small supply, gave 2s. 8½d. as the minimum. In order to prevent Breaston Church taking the supply of the Long Eaton Company, the Draycott Company had had to reduce their price to them to 2s., and to make other concessions. The Long Eaton Company had gone to the public houses and offered to take out the fittings, and to give much better light; they went to users of gas-engines and offered, if they would take the Long Eaton supply, to provide new gas-engines and to keep them in repair for nothing—the price for gas always being the low one of 2s., or, for power, even less. To builders who were erecting houses, and who had actually in some cases laid on the supply of the Draycott Gas Company, they had offered, if they would take the Long Eaton supply, not only to put all the fittings into the houses free, but to pay the builder the amount which he had spent in fittings in connection with the Draycott Company. They had duplicated the mains of the Draycott Company within the last few months almost throughout the district. Notwithstanding the offers they had made, however, they had only been able to secure between 50 and 60 consumers—nearly all of this number being on the prepayment system. It would be interesting to know the thousands of pounds the Company had spent the last few months, and the return, almost in shillings, which they were receiving. At present, the position was absolute clover for the consumers. The Long Eaton Company sent out canvassers, who told consumers in the Draycott area that at present they had the choice of two supplies; that the Draycott Company were much smaller than the Long Eaton Company; that the Long Eaton Company had a remunerative supply at much higher prices in their own district proper; that there would come a time when consumers would have no choice, but would have to take the Long Eaton Company's gas; that the Draycott Company might go on struggling, offering at present the same terms, but that, inasmuch as the Long Eaton Company had powers which the Draycott Company had not, the time would come when they would crush the Draycott Company, and that then they would have a monopoly, and the Draycott Company's consumers would regret that they did not go to the Long Eaton Company at the first onset. This was not a state of things which Parliament ever contemplated or intended. It was a little too bad when the Draycott Company had borne the heat and burden of the day, and had created a demand, that the Long Eaton Company should come along and say: "Now then, you having made the district, we are coming for the first time, after 27 years, to lay duplicate mains, and we are going to tell your consumers that you are so small in comparison with us that you cannot continue to exist, and we will wipe you out." In these circumstances, the Draycott Company asked Parliament to repeal the powers of supply of the Long Eaton Company in the district now supplied by the Draycott Company, and leave the Long Eaton Company with the area with which they were content for 27 years. A similar state of affairs existed not many years ago in the urban district of Golborne, Lancashire, as to which the Leigh Corporation had powers of supply, but declined to exercise them; the result being that the power of supply in Golborne was repealed. With regard to the proposed extension of the area of supply, Counsel stated that at the southern portion of the Draycott district there was a field which was in the parish of Draycott, but in the Long Eaton district of supply, and not in the Draycott area. At present, by arrangement with Shardlow, the Draycott Company were giving this place a supply, and were seeking to take it, together with its neighbours, into their limits. A Draycott main was laid underneath the bridle path that crossed the field; and it was necessary that the field should be in the area of the Draycott Company in order that the main might be there. The Long Eaton Company raised this matter as an important issue, and said that great injustice would be done them if the proposal were adopted. The field, which had no building whatever in it, was private property; there were no means of laying a main except under the bridle path, which was private. The gentleman who owned the field was in favour of the Draycott Company, and objected to the Long Eaton Company, and he would not allow the latter Company to lay a main on his property if he could stop them. The only petition against the Bill was that of the Long Eaton Company. In their petition, they stated that "during the progress of the Bill of 1901 your petitioners' predecessors, in order to effect a settlement of all outstanding questions between them and the Draycott Company, were prepared to come to an agreement for the division of the area in question in a manner which would have been greatly in favour of the Company." Thus they appeared to have realized at the time that Parliament did not desire or intend that there should be competition, and to have thought that the proper way was to divide or district the area. The petitioners went on to state that early in 1905 they "resolved to extend their mains into Breaston; there being then a demand for gas which was not met by the Draycott Company." The Draycott Company could conceive of only one incident to which that could apply. When the Long Eaton West-End Land Society commenced to lay out their property, the Draycott Gas Company asked if they might be allowed to put their mains there. The Land Society replied that they had arranged with the Long Eaton Company, that the Company's mains were in, and that they did not want the Draycott Company to supply them. This statement referred to the two isolated pieces of main already mentioned. In connection with a reference by the petitioners to an allegation in the preamble of the Bill that the Long Eaton Company were competing with the Draycott Company unfairly and improperly, Counsel stated that in 1895 the average selling price of gas in the Draycott area—which was very much less valuable than that of the Long Eaton Company, besides which the Draycott concern was very small—was 4s. 3d. per 1000 cubic feet, the sale being about 1½ million cubic feet of gas. Although they had never had a request to reduce the price, they had, as business grew, gone on reducing it until in 1907 the figure was 2s. 1d. At the time the invasion of their district took place, they were giving, he believed, one of the cheapest supplies in the United Kingdom. Indeed, having regard to the size of the Company, the gas was certainly the cheapest. The supply was not only cheap, but satisfactory to every one. The Long Eaton price had been 3s., less discounts, which worked out (10 per cent. being allowed for accounts of under £4 per quarter) to 2s. 8½d. net. Other discounts were also allowed; the figure for an account of over £20 per quarter being 30 per cent., which reduced the price to 2s. 1d. When, however, the Company entered the Draycott district, they offered even the smallest consumer a supply at 2s., although the same consumer in their own district would have to pay 2s. 8½d. Nobody could stand against this, It would be impossible for any parliamentary company to continue to exist if such a condition of affairs was allowed to prevail. In time there could only be one survivor if the Long Eaton Company supplied in the outside district on the low terms mentioned, and charged higher rates at home, although they had parliamentary powers to charge 1s. per 1000 feet more in the outer area. The people of Long Eaton were being made to pay for the competition which the Long Eaton Company were conducting with the Draycott Company in order to crush them. The moment the Long Eaton Company had done this, they could, of course, tell the Draycott people: "We cannot supply you on more favourable terms than we supply Long Eaton;" and then the Draycott Company having been killed by improper and unjustifiable competition, the people would have to take gas on the Long Eaton Company's terms. The petitioners alleged that they were exercising powers conferred on them in accordance with what they were advised was the settled policy of Parliament. Counsel could not understand what this meant. He did not believe there was another case in the country in which terms were being given to an outlying district which were lower than those at home. The Long Eaton Company also said that the public were amply protected by the operation of the sliding-scale provisions. As a matter of fact, the sliding-scale in this case was regulated by the Long Eaton price; and, consequently, the Long Eaton Company could charge lower prices in Draycott in order to crush the Draycott Company out without affecting their dividends at all. For years the Draycott Company paid no dividend. Recently they had done better. They were now paying 10 per cent.; but the average dividend was only about 4 per cent. Then the petitioners referred to "somewhat extraordinary financial arrangements" in connection with the formation of the Draycott Company, and said: "It is believed that the gas-works were constructed by Mr. Hooley, at a cost of about £2000, and that they were then nominally sold to the Limited Company, comprising Mr. Hooley and his nominees, at the price of £10,000, and this amount is named in the Act as the original capital of the statutory Company." This might or might not be true; but, as a matter of fact, not a farthing too much had been spent—a structural valuation of the works showing that every farthing in the concern was well represented in the works and plant. This matter was simply raked up to prejudice the Company. "That the actual value of the works," the petition continued, "was far below the last-mentioned sum, was shown by the fact that the undertaking was, a few years later, purchased by the present shareholders at a greatly reduced price." When evil times came on Mr. Hooley, he was glad to get rid of some of his assets at a low value; and the undertaking was bought from him at a very small price. Nevertheless, the whole capital was there. Moreover, what the Company had done with premiums obtained on the issue of capital—and to which the Long Eaton Company also referred—did not concern that Company. The auction clauses had been exercised; and although they had power to issue capital as ordinary capital, in the last ten years the whole of the money had been raised as 5 per cent. preference capital, and on the most remunerative terms to the consumer. In conclusion, Counsel hoped the Committee would intervene for the benefit of the Companies and of the public, and would not allow unusual methods and unfair competition to be brought to bear on a comparatively small company.

THE PROMOTERS' EVIDENCE.

Mr. *J. N. Derbyshire*, the Chairman of the Draycott Gas Company, examined by Mr. TALBOT, gave evidence bearing out Counsel's opening statements. He said that in 1896 the authorized capital was £10,000, in £10 shares, the whole of which was bought by his firm (Messrs. Derbyshire Bros., of Nottingham) or gentlemen connected with it. By enterprising measures, the sale of gas had been increased from about 1½ million cubic feet in 1895 to 35 millions in 1907. The concern was bought from Mr. Hooley before he had become bankrupt, and before he had become a London man. The purchase was effected on the eve of Mr. Hooley's acquisition of the Dunlop Tyre Company, when that gentleman wanted money very badly. In February, 1907, the Long Eaton Company commenced laying mains in the Draycott district. They came "sailing along day by day," and by the 1st of May had penetrated to the heart of Breaston. On that day, witness went to Draycott and Breaston, took counsel with the Works Manager, and interviewed all the principal customers in Breaston. The latter were very nice, but told him, if he wanted to continue supplying, he

must charge 2s., because they could get gas at that price elsewhere. Witness said: "Very well, I must supply you at 2s.; but you must not leave us on any account." Among other things, witness was shown a letter from the Long Eaton Company to the Churchwardens of the Breaston Parish Church, in the course of which they offered to connect up the gas to the church free, and supply it at the same price as was charged at Breaston—3s. per 1000 cubic feet, less 1s. discount, making the net price 2s. They also offered to relight the church with No. 4 Welsbach bye-pass burners, mantles, and globes, free of charge. Witness said he accepted the conditions contained in the letter.

Mr. *M. J. Astle*, the next witness, was interposed at this stage. In reply to Mr. TALBOT, he stated that he was the Governing Director of Marcus Astle and Company, Limited, cotton doublers, of Wilne Mills, Draycott. Until 1896, his Company made their own gas. In that year, the Draycott Company brought their mains into Wilne, and offered to supply his Company at, he thought, 3s. per 1000 cubic feet. They accepted the offer, and dismantled their works. Their consumption was from 4 million to 6 million cubic feet annually. Since then the Draycott Company had always met them very fairly, and had reduced the price, he supposed, as a matter of agreement. There had not been a demand for a reduction. He was quite satisfied with their conduct. He put down the foundations of a producer plant for gas; but Mr. Derbyshire made such terms that he cancelled the order, and went on taking a supply from the Company. In September last, he was approached by a gentleman from the Long Eaton Gas Company. Witness told him he did not wish to have anything to do with him. In his opinion, the action of the Long Eaton Company in offering to supply in Draycott was not right. He could with confidence say that there was no demand for competition or for an additional supply of gas, in the district.

In cross-examination by Mr. HUTCHINSON, witness said he could see good in competition. At first he had a supply at 3s.; it was now 1s. 6d.

Re-examined: Until the occasion to which he had referred, the Long Eaton Company had never approached him with a view to giving him a supply.

Mr. *Derbyshire* was then further examined by Mr. TALBOT. The Long Eaton Company charged for gas consumed through prepayment meters 1d. for 25 or 27 feet, according to whether the houses were or were not fitted by them. In Breaston, the charge was 1d. for 30 feet. The Draycott Company had, without break, continuously lowered their prices. At the present time they charged 2s. for lighting gas; if used for gas-engines, it was 1s. 6d. In Long Eaton the price was 2s. net.

Mr. LYNCH: 2s. 8d. was stated?

Witness: The Long Eaton price is 2s. 8½d. In Long Eaton, it is gradually going down by discounts to 2s. 1d.

The CHAIRMAN: 2s. 1d. for large consumers?

Witness: Yes; and I believe there is 5 per cent. off for lace factories, which, if a manufacturer were large enough to take £80 worth of gas per annum, would bring it down to 2s.

Continuing, witness said that to small consumers the charge of the Long Eaton Company in Long Eaton was 2s. 8½d.; while in Draycott it was 2s. In Long Eaton the discount was 10 per cent. to small consumers; so that they paid 2s. 8½d. In Draycott, the charge of the Long Eaton Company was 3s., less 33⅓ per cent., or 2s. net. Witness produced bills showing the discounts allowed by the Long Eaton Company. In one case, a gentleman in Draycott, whose quarter's account was 5s. 1d., received 33⅓ per cent. discount; whereas another consumer in Long Eaton, whose quarter's bill was 16s. 9d., received 10 per cent. discount—the dates of the two bills being within a day or two of one another. Witness in one instance agreed with a builder named Short to fit up 64 houses for him with gas. In August last, Mr. Short stated that he had an interview with representatives of the Long Eaton Gas Company, who said they would fit up the houses free of cost. Mr. Short replied: "I have already agreed to have some of them fitted up by the Draycott Company, and they have done some of the work." The representatives replied: "Well, we will repay you that." Objection being taken to a detailed account of the conversation being given, witness said he received information that the Long Eaton Company had made certain offers to Mr. Short; and that therefore he (witness) had to agree to fit up the 64 houses free of cost. He also agreed to supply best slag asphalte, delivered on the site of the buildings, at 8s. a ton, and tar at 1s. per cwt.—these prices being much below the usual market value. The service pipes and fittings were to become the property of the freeholder. In one case in which a new street was being laid out off Derby Road, Draycott, last year, witness was refused permission to lay mains; the Architect, Mr. Sheldon, stating that mains had already been laid by the Long Eaton Company, and that the owners did not care to have two mains in the street. The Draycott Company were smaller than the Long Eaton Company, and could not stand against unfair competition by a much larger concern. In 1896, they had to raise capital. They did this by borrowing temporarily from the bank on the personal guarantee of the Directors. In 1897, having paid no dividend in the two preceding years, and having made only £20 in 1896, they had to issue capital. Debentures would not have given sufficient; and they therefore issued 5 per cent. preference capital. At that time they were doing better; and they knew they could easily pay 5 per cent. dividend. They therefore issued £6000 preference capital at the minimum price of £110; and they obtained 1s. or 2s. above this. A further sum of £3200 was issued on exactly the same terms in 1903; the amount of the premiums being £800. This exhausted the capital powers of the Company, except as to loans. Of the £800, a good deal had been put into the works; the balance being in hand. Out of profits, £234 had been added to the premium reserve account, raising it to £650. If the Long Eaton Company charged over the whole of their district 2s. 9d.—which, judging by the analysis of their accounts, witness made out to be the charge for gas in 1906—the Draycott Company would not have much to fear from competition, and still less would they fear it if the charge was 1s. more in Draycott than in Long Eaton. Nominees acting for the Long Eaton Company had recently bought the Sandiacre Gas-Works, another of Mr. Hooley's ventures. The charge in the Sandiacre area was 3s. 6d.; so that there were three prices for gas in the Long Eaton Company's area.

Tuesday, March 24.

Mr. *Derbyshire*, in cross-examination by Mr. BALFOUR BROWNE, said it was obvious that if the Long Eaton Company wished to supply in the Draycott area that Company would not have allowed the Draycott Bill to be promoted without opposing it. He objected to competition in the supply of gas. As an academic proposal, he supposed competition benefited the consumers. In this case competition had for the time being reduced the price of gas; and so long as it lasted, it would continue to keep down the price and benefit the consumer.

Mr. BALFOUR BROWNE: Why are you here then trying to put an end to the competition which is a benefit to the consumers of gas?

Witness: I do not call this competition. If we could do in your district what you have done in ours, I should call it competition. You are charging a different price in the competition area from the one in the district where you are not competing.

Are not you doing precisely the same thing?—We were not until you came and compelled us.

Continuing, witness said he did not know that if the Long Eaton Company were excluded from the disputed area, the Draycott Company would raise the price of gas. So long as the Long Eaton Company were getting a high price in Long Eaton, they could afford to sell outside at competition price until the Draycott Company died. Even at the competitive price, the Draycott Company were paying their standard dividend of 10 per cent. on £10,000, which worked out at 25 per cent. on £4000—the sum paid Mr. Hooley for the undertaking. He could not say anything as to whether Mr. Hooley put only £2000 into the undertaking and then turned it into a Company with a capital of £10,000, on which dividends were now being paid. When witness bought the concern, he did not know the Long Eaton Company had concurrent powers of supply in the Draycott area. He had heard the last few weeks that it was illegal to issue, as the Company had done, preference shares which were cumulative.

In re-examination, witness said he would not object to competition on equal or fair terms. If the Draycott Company could do to the Long Eaton Company what they had done to them, he would not object. Whatever terms were given by the Draycott Company, they had to give to all. The Long Eaton Company had no such provision, with the result that they were supplying at comparatively high prices in the main district, which enabled them to supply at a lower rate in the Draycott area. There was a very strong feeling in Draycott in favour of the Draycott Company.

Mr. *Ernest Jardine*, examined by Mr. HONORATUS LLOYD, stated that in 1899 he joined the Board of the Draycott Gas Company. He owned at Draycott 90 houses and the Victoria Mills, which were occupied in tenements by a number of lace and clothing manufacturers. All the tenants took gas from the Draycott Company; their consumption being about 4 million feet per annum. The present price of the Draycott Company was lower than that of any other company in the district. Asked if he did not think it advantageous to have two Gas Companies overlapping in the same area, witness said he should be glad, as probably the largest owner of property in Draycott, if the Long Eaton Company would undertake to supply gas, at all times, in Draycott at 8½d. per 1000 feet less than in Long Eaton, as they are doing to-day. He was not speaking as a Director, but as one deeply interested in Draycott. He thought it would be in the interests of the neighbourhood; but he did not think there was any probability of this. They wanted to crush the Draycott Company out of existence, and then punish them, as they were punishing Long Eaton to-day.

Cross-examined by Mr. HUTCHINSON: He welcomed competition, because it stimulated those concerned to do better. With illegitimate competition, the purchaser suffered in the end. The competition of the Long Eaton Company was illegitimate. It was not correct that the Draycott Company lowered their price by 8d. in 1905 in order to meet the competition, direct or impending, of the Long Eaton Company. Shardlow was supplied by the Draycott Company at a higher price than was charged in Draycott, because it was outside their area.

In re-examination, witness said at Shardlow, as at Wilne Mills, there was a producer gas plant; so that the conditions in this respect were identical, except that at Wilne Mills the consumption was much greater. Until the Long Eaton Company came into the Draycott district, the Draycott Company charged exactly the same price in Draycott, Breaston, and Shardlow. The Shardlow price was the same now as then; elsewhere the price had been reduced to meet the Long Eaton Company's competition.

Mr. *J. G. Salmon*, in reply to Mr. TALBOT, said he had been Manager of the Draycott Gas Company since the works were built in 1887. He understood that Mr. Hooley applied to the Long Eaton Gas Company for a supply; but that they declined to accede to the request unless they had a guarantee of 10 per cent. on the outlay. The concern had been offered for sale to the Long Eaton Company, and to the Spondon Gas Company. The Company had never lost a customer until the invasion by the Long Eaton Company, when a few consumers had been seduced from them. In one case in which the Company had to discontinue supplying, witness had every reason to believe the consumer was given a gas-cooker free by the Long Eaton Company. In another case the Long Eaton Company "fitted up" the consumer for nothing, with the result that he went to that Company.

In cross-examination by Mr. HUTCHINSON, witness said the Draycott Company had lost five consumers in Breaston and three in Draycott. The Draycott works were in the best of repair. Asked if he knew that the amount of money appearing in the accounts for last year as spent in repairs of works and the whole of the undertaking was under 2d., witness said possibly that was owing to his being able to do the biggest part of them without calling in contractors.

Mr. *R. W. Johnson*, the Chairman of the Draycott Parish Council, stated that since the present Directors of the Draycott Company had taken charge of the undertaking the gas supply of the district had improved and increased. There had been no complaint until last year, when the Council thought some of the public lamps were being put out. They learned subsequently that the Company were troubled with naphthalene. When the Long Eaton Company began to lay their mains in the district, the feeling in the parish was that it was an unwarrantable invasion.

In cross-examination, witness said the Parish Council complained to

the Company three times between November and March last. There had been a decided improvement in the public supply; and he thought the Company had now surmounted the difficulty.

Mr. *T. C. J. Harrison*, a civil engineer residing at Breaston, stated that he took gas from the Draycott Company. In May he was visited by a canvasser of the Long Eaton Company, who said that probably competition could only end in one way—that the Draycott Company would have to give up, and that those people who had taken Long Eaton gas would probably receive preferential treatment. In Breaston, feeling was distinctly against the Long Eaton Company.

Mr. *J. R. Copestick*, the Churchwarden of Breaston Church, gave evidence as to the letter containing the offer of the Long Eaton Company, and as to the Draycott Company agreeing to give a supply in accordance with the terms of the offer. The Draycott Company had always given a satisfactory supply to the church. The Draycott Company had supplied more gas in Breaston since the invasion of the Long Eaton Company.

Mr. *A. Chester*, a member of the Long Eaton Urban District Council, stated that he had called the attention of his Council to the fact that the Long Eaton Company were charging less in Draycott than in Long Eaton, and moved a resolution in favour of an appeal to the Board of Trade. In Long Eaton there was a feeling against the action of the Company; some of the people holding, as he did, that it was not fair. He did not use gas; but as a ratepayer he had to pay for gas consumed by the street-lamps. He did not think it fair that the Company should charge less outside than inside Long Eaton. The Company should be made to charge more according to their Act. They should charge 1s. more in the outer area, the effect of which would be to benefit the Long Eaton people.

Mr. *Corbet Woodall*, examined by Mr. HONORATUS LLOYD, stated that the works of the Draycott Company were in a very good state. The story of the Company was eminently creditable to its management. He was satisfied that the capital was represented in the works. Proof of this was afforded by the fact that the total capital per million cubic feet of gas sold had been brought down to £686. This was very reasonable for works of the kind and size of these. The price of gas before the Long Eaton Company began to compete was very reasonable, and compared favourably with neighbouring companies supplying under anything like similar conditions. There was no reason why the Long Eaton Company should not have obtained capital, if they required it, to supply the Draycott area before the Draycott Company started. The explanation of the fact that the Draycott Company took by their Act of Parliament concurrent powers of supply in their area was due probably to the circumstance that they obtained in that way an unopposed Bill. To a small company, a contest in Parliament, such as the present, was a very serious matter. It was not in the interests of the public that the two Companies should exercise overlapping powers in the same area. He thought he was right in saying that there was not a parallel case to this in the United Kingdom. He did not know of any instance in which two companies were competing with one another for a supply in the same area. He felt sure that for 40 years past Parliament had never knowingly granted competing powers to gas companies in any area. In former years competing powers were granted, with the result that districting and partitioning took place between the companies. London was a very conspicuous illustration. There, about the year 1853, districting commenced among the 13 companies supplying. This continued till 1860, when an Act was passed confirming and defining the areas. Since then competition had ceased, with the result that the price of gas came down rapidly and considerably; and the efficiency of supply and reduction of leakage was very marked. The methods under which competition had been inaugurated in this district were scandalous and disgraceful. Having regard to the comparative sizes of the two Companies, the policy of the Long Eaton Company, if the public of Long Eaton consented to its being continued, could have but one result. It was palpable on the face of the whole transaction that the intention of the Long Eaton Company was to wreck the Draycott Company, in order that they could either buy them out, or cause them to come to bankruptcy. But that they would maintain the prices they were now selling at in Draycott he did not for an instant believe. He did not think the Long Eaton consumers would sit down and bear it. He had not heard of a case in which less was charged in an outlying area than in a district near the works. Such a method had, and could have, no other purpose than to crush the existing Company. Having achieved their object, there would be a return to the ordinary practice of having a uniform rate, or a higher rate for the outlying area.

Cross-examined by Mr. FITZGERALD: In their Bill of 1887, the Draycott Company proposed to repeal the powers of the Long Eaton Company in the district in dispute. When deposited, however, the Bill did not contain the proposal. He did not know that there was a meeting of the representatives of the two Companies, and that the Draycott Company agreed that their Bill was not to contain anything to interfere with existing powers. He thought competition in electricity was in the interests of the public, if the supply was properly regulated. To a limited extent, however, competition was recognized by the Electric Lighting Acts, which were much later than the Gas Acts. There was very little competition in electricity. The effect of competition, so long as it was keen, was to reduce the price. At the present price, the Draycott Company were able to pay 10 per cent.; but they had only suffered from competition for four or five months, and during the rest of the year they had a higher price. In the Golborne case, the Leigh Corporation had shown, by actual refusal and by their actions, that they did not intend to supply in the Golborne district. In that instance, it was only after notice of intention to apply for a Bill was given that the Leigh Council laid a pipe for the purpose of saying they had a main in the Golborne area.

Sir *George Livesey*, examined by Mr. CLEASE, said that, in his early days, the almost universal rule in all large towns was competition. In London there were as many as three or four companies' mains in one street. It became intolerable, and the companies themselves at last agreed to district their areas, to the advantage of the public as well as of the companies. The nuisance and inconvenience to the public were so great in London that, after the companies had agreed on their districts, Parliament, in the interests of the public, authorized the arrangement. The South London Companies districted in 1853; and in 1855 they promoted a Bill to authorize the districts. Public feeling, however, was against it. The public felt that they had no longer the protection of competition, and the Bill was thrown out. In the year 1858, the North London Companies districted; and in 1860, seeing that competition was done away with, the Metropolis Gas Act was passed, in the public interest, to regulate the supply on the principle of no competition—that is, of a monopoly. He took it that Parliament gave a gas company authority to supply a definite area, not for the interest or benefit of the gas company, but for the benefit of the public. He did not think from 1860 Parliament ever sanctioned competition between gas companies. There were certain portions of the districts of the London companies which could not be supplied by the company to which the district was allocated. The adjoining company then took up the supply on the ground that the public had a right to a supply of gas, and the fact that Parliament had given a company this district conveyed the implied obligation to supply gas to all who wanted it. If the company could not supply it, arrangements were made with the adjoining company to do so for a time. If the company having the right to supply in the district were never able to reach it, the district passed over to the other company.

Cross-examined by Mr. FITZGERALD: He agreed that in 1887 the Draycott Company obtained concurrent powers in the Long Eaton district, after negotiations with the Long Eaton Company; and on the distinct understanding that the latter Company's powers were not to be interfered with, the Draycott Company gave up the request that the Long Eaton Company's powers should be disallowed.

Mr. FITZGERALD: A bargain is a bargain even between two gas companies?

Witness: Yes. But a gas company ought to fulfil its obligations; and there, I contend, the Long Eaton Company were altogether wrong. They might have supplied Draycott if they had liked.

Proceeding, witness said the Long Eaton Company left the district alone all these years, and deserved to lose it unquestionably. The Draycott Company, having been authorized by Parliament to supply in the district, and the Long Eaton Company having neglected it, all their right had lapsed morally.

In re-examination, witness said the Draycott Company, in putting capital into the concern, had every right to assume that the powers of the Long Eaton Company not having been exercised till then, would not be exercised. It was an atrocious thing that the Long Eaton Company should go into an area which they had neglected for 26 or 27 years and supply gas at 8½d. per 1000 cubic feet less than they were supplying at home, although the Acts under which they operated gave them power to charge 1s. more in the outer area.

Mr. *Charles Hunt* stated that he had carefully examined the Draycott Company's works, which were fully efficient for the production of about 190,000 cubic feet of gas daily, as against the greatest daily requirement at present of about 140,000 cubic feet. Some extension of the gasholder capacity was required. The price charged was very moderate. The laying of mains in the Draycott area by the Long Eaton Company was not so far, from the shareholders' point of view, justified—it had entailed a loss. The expenditure on these mains he estimated at £4200.

In cross-examination by Mr. BALFOUR BROWNE as to who would compensate the Long Eaton Company for the loss entailed in respect of the mains they had laid in the Draycott district "under the authority of Parliament," witness said it was for the Committee to decide. He had never heard of statutory powers being taken away without compensation. The amount usually spent on repairs was 6d. or 7d. per 1000 cubic feet of gas sold. In 1906, the figure in the Draycott area was 1·55d. This was low; but they had to take the average. Counsel suggested that the figure for 1900 was 2·98d.; 1901, 2·26d.; 1902, 4·64d.; 1903, 5·94d.; 1904, 7·91d.; 1905, 3·73d.; 1906, 1·88d.; and in 1907, 2·37d. Witness, without accepting these figures as accurate, replied that he had inspected the works and saw no indication that they had been starved. The works showed no indication of wanting repairs; and he could tell from the leakage whether the mains were properly repaired.

Re-examined by Mr. CLEASE: There was practically no leakage. The unaccounted-for gas had never risen above 3·24 per cent. since 1895. In the circumstances, it would not be fair to make the Draycott Company pay compensation for taking up the mains of the Long Eaton Company.

Mr. *J. Smith*, estate-agent and tax collector of Long Eaton, stated that he was Secretary to the Long Eaton Company for 17 years prior to the appointment of the present Secretary. About 20 years ago, Mr. John Golborne and many inhabitants of Breaston presented a petition to the Company asking them to extend their mains to Breaston. The request was refused, on the ground that the return would not pay interest on the capital outlay. In Long Eaton there was a feeling now that it was not right for the Long Eaton Company to charge by slot-meters, and only give 20 cubic feet for 1d.

In cross-examination, witness said if there was no record of the petition in the minutes of the Company, he could not explain the matter.

This concluded the case for the promoters.

THE PETITIONERS' CASE.

Mr. *E. Williams*, Solicitor and Clerk to the Long Eaton Urban District Council, examined by Mr. FITZGERALD, said he was formerly a member of the firm of Whittingham and Williams. In January, 1886, Mr. Whittingham was appointed Solicitor to the Long Eaton Gas Company; but the work of the Company was done mainly by witness. On Aug. 14, 1886, the Company received a letter from the Solicitors to Mr. Hooley asking on what terms they would be prepared to supply gas. A reply was sent on Sept. 7, 1886, asking if Mr. Hooley would take a supply from the Company's pipes at the boundary of the Long Eaton district. Mr. Hooley never replied to this; and the negotiations ended there. If there had not been a distinct statement that the Long Eaton Company's rights would not be interfered with by the Draycott Company's Bill of 1887, the Long Eaton Company would have opposed it. In connection with the Long Eaton Company's Bill of 1901, witness sent to the Draycott Company a plan showing a division of area to which the Long Eaton Company were willing to agree. The division

proposed would have given the Draycott Company the area that Company were then supplying. The suggested division was not, however, accepted. In January, 1903, the Long Eaton Council started electricity works; and there had since been very active competition between the Council and the Company—the consumption of electricity having since largely increased.

Mr. *S. Hind*, an operative lacemaker of Breaston, and a member of the Parish Council, stated that he had taken a supply of gas from the Draycott Company, but was dissatisfied with its general quality. It did not give a good light, it was dirty, and the stench was abominable. It was a bad article at a high price. He was the first customer of the Long Eaton Company in Breaston. He was not offered or given anything by the Company. It would be an advantage to Breaston if the Long Eaton Company continued to supply gas there. He believed in competition, and would like to keep both Companies in the place. There was a tremendous amount of feeling in support of the Long Eaton Company among the working classes; but the big landlords would not allow the little householders to have a supply from that Company—being more in favour of the Draycott Company, in which some of them were shareholders.

In cross-examination, witness said he went to the Long Eaton Company and asked them to supply him when they laid their main. He was influenced by the Long Eaton price.

Mr. *Thomas Merry*, examined by Mr. HONORATUS LLOYD, said he was Chairman of the Breaston Parish Council and one of the largest ratepayers. Since October he had been a customer of the Long Eaton Company, whose gas was very good. He believed in competition, and favoured the presence of the two Companies in the village.

In cross-examination, witness said he could not say whether he would continue to get gas at 2s. per 1000 cubic feet if the Draycott Company were out of the way and the Long Eaton Company's price in Long Eaton was 2s. 8d. The Long Eaton Company fitted up his gas supply. He had to pay them for doing so, but had not actually paid yet. The fittings belonged to the Company. They had not made him a present of them.

Mr. HONORATUS LLOYD: They were put in six months ago.

Mr. *A. W. O'Brien*, a coal merchant of Draycott, and a member of the Draycott Parish Council and of the Shardlow Board of Guardians, said he was supplied with gas by the Draycott Company. It was for the general interest that the two Companies should supply; and it would be a very bad job if either was taken away. There had been about half-a-dozen complaints with regard to street lighting.

Cross-examined as to whether any of the other six members of the Draycott Council were against him in regard to the gas supply, witness said they had been; but they had reconsidered the matter, and one or two had said the district was the better for the competition. He found no fault with the Draycott Company's gas.

Mr. *H. Hare*, a relieving officer of the Shardlow Union, residing at Draycott, said it was to the advantage of the inhabitants of Draycott that the two Companies should continue to supply. He had heard complaints in the last few months about the Draycott Company's gas, which was somewhat dirty. He had heard that the Draycott Company had put gas-fittings into houses free. The result of competition was that houses which would never have had gas, had it now, and at a cheap rate.

Wednesday, March 25.

On the resumption of the proceedings to-day,

Mr. *George Stevenson*, examined by Mr. FITZGERALD, said he had been Secretary and Manager of the Long Eaton Gas Company since 1899. Until the Company promoted the Bill of 1900, gas was supplied by them to Long Eaton and Sawley only. About that year, however, Long Eaton had extended, and reached the outskirts of the parish on the road to Breaston. In 1903, the Long Eaton Council commenced to supply electricity. The competition with the Company was very severe, and they lost a number of consumers. The Company faced the competition like men, and did not come whining and asking that the supply of electricity should be stopped. In October of 1903, he conducted a canvass of Breaston to see what consumers of gas were likely to be found there. The canvass was carried on openly, and was known to the Draycott Company. At that time, there were, as far as he could make out, no slot-meters and very few cookers in Breaston. In the same year (1903), the Long Eaton Company decided, in connection with the operations of the West End Land Society, to take their mains to the outskirts of Breaston. The Land Company could not proceed with the laying out of their streets for want of capital until the middle of 1905; and about August of that year the mains were laid in these streets. The mains were laid "dead," to save the cost of pulling up the street again and for the sake of convenience; and they were not coupled up with a main from Long Eaton until the spring of 1907. When laid, there were no houses at all in the streets. There were seven or eight houses there now, and gas was being supplied to them. Only the Long Eaton Company had laid mains to this portion of Breaston. It was the settled policy of the Directors, from the time they obtained their Act of 1901, to go on extending the mains to Breaston and Draycott. In December, 1906, witness was instructed by his Directors to submit plans and estimates of the cost of extending the main into Breaston and Draycott. Contracts were entered into, and the first section (as far as Draycott Station) was completed in April, 1907. These proceedings were open and known to everybody in the district. A main ran from Breaston to Risley for the supply of the latter place. If the proposal of the Bill were carried out, the Long Eaton Company would be cut off from Risley.

By the CHAIRMAN: The Long Eaton Company were taking the gas-works at Sandiacre. It was in contemplation to supply Risley from Sandiacre; but this could not be done at present.

In further examination, witness said that in the year 1907 the Long Eaton Gas Company's price was 2s. 8½d. per 1000 cubic feet, and the Draycott Company's 2s. 10d. On April 11, however, the Draycott Company issued a circular reducing their price to 2s. 6d. This showed conclusively that the rate-cutting was commenced by the Draycott Company. The two Companies were now supplying practically at the same price. On the faith of the authorization by Parliament in 1901 to supply gas in the whole of their district, the Long Eaton Company proceeded, in September, 1907, to issue stock under the auction clauses. They were now paying 6 per cent. on the "A" converted stock, and £4 14s. 6d. per cent. on the new issue of "B" stock. It was the intention, on going into Draycott, to continue supplying at 2s. 8½d. They were, however, forced into the rate war by the action of the Draycott Company. In Breaston and Draycott they had, in all, 56 consumers; and he anticipated obtaining a very much larger number. The Draycott Company had spared no effort to prevent consumers going to the Long Eaton Company pending the promotion of the present Bill. The people had the impression that they had better remain as they were until things were settled. He had searched the minutes of the Company, but could not find any reference to a request from Breaston or Draycott for a supply of gas. Nor were there any papers relating to any such thing. Breaston Church had been very badly lighted; and the Long Eaton Company thought if they illuminated it, they would get a good advertisement. Witness denied the suggestion made on behalf of the Draycott Company that in several instances the Long Eaton Company had offered considerations to induce consumers to transfer from the Draycott to the Long Eaton Company. Prepayment fittings were put in in some cases by the Long Eaton Company; but they would be paid for by the consumer in the ordinary way. One consumer said he was afraid, if he let the Long Eaton Company supply him, that the Draycott Company would not go on supplying him with tar and asphalte. Witness could not believe this statement. Still, he said his Company would supply him at their ordinary prices for these things. There was no foundation for the suggestion that witness and his Company had been threatening to smash the Draycott Company.

Cross-examined by Mr. HONORATUS LLOYD: The policy of the Long Eaton Company, since he had been with them, had been to charge the same price throughout the whole of their district. At one time Sawley was charged 2d. extra; but witness agitated until the extra price was removed. The object of charging a lesser figure in the outlying area was competition. The price charged paid fairly well. Asked if this was fair, witness said the Long Eaton prices were governed by the electricity prices, and 2s. 8½d. per 1000 cubic feet was not an unreasonable price. The price of 2s. in Draycott was remunerative to the Long Eaton Company; but it did not yield them a full dividend. The Long Eaton Company sold about 319,000 cubic feet in Breaston and Draycott in the portion of last year in which they supplied there; and the gross income was from £40 to £45. It cost a little over £3000 to lay the mains to these places. The cost of gas to the Long Eaton Company last year was, he thought, 1s. 10d. Questioned as to whether it was not 1s. 11·87d., he said he had not the figures by him. The Long Eaton Company's undertaking in the Draycott Company's area was not paying very well at present. They were looking for developments. They were not making a dead-loss. The price the Draycott Company were charging before his Company entered the district was not unreasonable. Witness produced a list of minutes of the Company, from which it appeared, *inter alia*, that in 1890 the Long Eaton Company had an offer of the Draycott works and refused to buy them. Nominees of the Long Eaton Company had agreed to purchase the Sandiacre undertaking with a view to amalgamation. Despite the competition of electricity, the business of the Long Eaton Company was growing. The Directors would have to settle, in the event of this Bill not passing, whether they would continue to charge 2s. It was possible to go on charging this price; and there was no reason why they should not. He thought the Draycott Company also could go on supplying remuneratively at 2s. If they could not, and the Long Eaton Company could, there could be but one result—the Draycott Company would go under. In that case, only one gas would be obtainable in the Draycott area. This would be so, also, if the Long Eaton Company were wiped out. Witness was cross-examined at some length with regard to the allegation that the Long Eaton Company had supplied, or promised to supply, fittings for nothing in the Draycott area. He maintained, however, that free fittings had not been supplied, except in the case of prepayment fittings, and these were paid for indirectly in the higher charge for gas. It was true slag and tar had been offered, but at market prices.

In re-examination, witness said if the Draycott Company had not begun to cut prices, the Long Eaton Company would have supplied in the Draycott area at the same price as in Long Eaton. So long as the Long Eaton Company did not pay their maximum dividend which they would make out of Long Eaton, he could not see that any injustice was caused to a Long Eaton consumer by the Company spending their profits to meet the cut-price in Draycott. The figure of 319,000 cubic feet was for the period of about four months last year in which the Long Eaton Company supplied in the Draycott area. This was about a million feet per annum. The supply through prepayment meters was considerable; the receipts from the Draycott area at 2s. 9d., which it was suggested was the price prepayment consumers would pay, would give £130. The cost of gas last year was 2s. 5½d., which, on a million cubic feet, amounted to £82. The £3200 included other mains than those needed for the supply of Draycott. One of the minutes of the Company, dated March 27, 1907, read "Discussion *re* price to be charged at Breaston. Resolved: That the price should be 3s., less one-third for cash monthly, making 2s. net. Slot-meters 10d. extra, as at Long Eaton."

Mr. HONORATUS LLOYD: Our notice of reduction to 2s. 6d. per 1000 cubic feet was sent out on April 11—a month later.

Witness: This resolution of March 27 was not confirmed till April 6; and we did nothing before it was confirmed.

Mr. HONORATUS LLOYD: Even that is before our reduction to 2s. 6d.

Mr. HUTCHINSON: As a matter of fact, who first cut so far as the consumer was concerned?

Witness: The Draycott people, certainly.

In further cross-examination, witness said another minute ran "April 10, 1907. Resolved: If consumers wish, we will undertake to supply at 2s. for two years certain; and at no time will it ever be higher than at Long Eaton."

Mr. *E. H. Stevenson*, examined by Mr. BALFOUR BROWNE, stated that for some years after the Long Eaton Company obtained their statutory powers they had their time pretty well occupied in serving Long Eaton

and Sawley, which increased much more rapidly than their other area of supply. Gas companies always supplied the place where the demand was most felt, and waited until there was population in the outlying districts before supplying there. Mr. Hooley's gas-works, in the year the Company bought them, sold 2,308,000 cubic feet of gas. The probable cost of works to supply this quantity could not exceed £3000. A Company was formed, with a capital of £20,000, of which £10,000 was put down as the price of the works. There was no doubt, if £10,000 was put down for the works, there was over-capitalization. The capital cost had come down from £11,337 per million feet of gas sold (which was quite an exaggerated figure) to £686. The latter would be reasonable for a company of this size who were supplying gas in the ordinary manner. But where a company were supplying a large proportion of gas to mills and for power, a very small amount of capital was required outside the works. Therefore, he considered the figure of £686 high. In Long Eaton, there was a consumer whom it cost about £5 to connect, and who took 9 million cubic feet of gas. When he had the electric light instead of gas, it cost the Long Eaton Company over £5000 to fit up other consumers to use the same quantity of gas. Thus the amount of capital required for large consumers was small. In 1901, when the Long Eaton Company applied to Parliament for further capital, the districting of the competition area was suggested solely with a view to preventing competition—for the sake of peace. This offer by the Long Eaton Company was exceedingly generous; and he could not understand why the Draycott Company did not accept it.

Mr. HONORATUS LLOYD: You did not want to go into Draycott?

Witness: We did not want to go there; but the Company would not come to any agreement with us—in other words, they challenged us.

Mr. BALFOUR BROWNE: You said: "If you agree to this, there shall be peace." They would not have peace; and now they have to put up with war?

Witness: They would not agree to peace; and it must be war. We certainly did our best then to arrive at peace. We did not get any counter offer except, "No; go out of our district altogether."

Replying to further questions, witness said there was no doubt that competition was in the interests of the consumers of gas. It was a benefit to have two companies competing. Since there had been competition between illuminants, gas companies had done their duty a great deal better to the public. He did not think this competition would have the effect of ruining the Draycott Company. He thought it would reduce the 25 per cent. profit on the purchase money; but it would not kill the Company, or anything approximating. The Company had a large district outside the area of competition. If the 25 per cent. was reduced, it was their own fault, because they would not have peace. The Long Eaton Company intended at first when they went to Breaston that their rates should be the same as at Long Eaton. It was useless, however, to go to Breaston and offer gas at 2s. 8½d., when Draycott was supplying at 2s. 6d. The Long Eaton Company were not seeking to exclude the Draycott Company, and were quite willing to continue the competition.

Mr. BALFOUR BROWNE: On fair lines if we can; but on unfair lines if they give the example.

Witness: I do not know what you mean by unfair lines.

What they suggest as unfair is that we are supplying in this district at lower rates than in Long Eaton?—It is always so. The competitive district will get gas more cheaply than the non-competitive. It is so with Draycott now.

Are they doing the same?—Exactly the same.

Witness went on to say that Draycott had been starving the works; they had been spending too little on repairs and maintenance. If they did not spend enough to keep the hereditament in the condition necessary to earn the rent and provide their maximum dividend, they were not doing right. Such a course was a method of paying dividends out of capital, because it had to be put back into the undertaking at some time or other. It was admitted that they had no right to raise cumulative preference shares. The word "cumulative" led people to give more for the stock than it was really worth. A larger premium must have been obtained for the stock than would have been got if it had been issued legally. In putting the premiums to a reserve account, they acted incorrectly. Capital should not be put to a reserve account. The purpose of a reserve account was to make up dividends when they were short. Moreover, the Company at that time were absolutely prohibited from making a reserve account. A reserve account could only be made by the Company out of divisible profits beyond the standard dividend. Premiums should go into capital account, be spent on the undertaking, and bear no dividend.

Mr. HONORATUS LLOYD said that was the case here.

Mr. BALFOUR BROWNE: They put premiums into the reserve fund, which is not a capital account.

Mr. HONORATUS LLOYD: It is. It is called a reserve account; and it is a reserve capital account.

Witness: It is the first time I have ever heard of a reserve capital account.

Mr. BALFOUR BROWNE: Did they put revenue into it?

Witness: They did.

Asked how could it be a reserve capital account if revenue was going into it, witness said he did not know. It was only this year that they had altered the title and called it "Reserve Premium Account."

The CHAIRMAN: Have we heard of the reserve premium account yet?

Mr. HONORATUS LLOYD: Yes. Mr. Derbyshire gave the details of how it was spent. Part of it was spent on capital account on the works and the rest is held in cash under the heading "Reserve Premium Account."

Further examined by Mr. BALFOUR BROWNE, witness gave an account of the proceedings in the Golborne case—stating that in 1876 the Gas Committee of the Leigh Corporation said distinctly that they did not intend at any time to supply gas in Golborne; that the Engineer of the Leigh Corporation, with the sanction of the Leigh Corporation Gas Committee, advised the Golborne Company how to improve their supply of gas; that in May, 1900, the Leigh Corporation, in order to supply a place called Layton, laid a 3-inch main, which passed the thoroughfare leading to Golborne, and yet did not supply Golborne; and that notice by the Golborne Company of their intention to exclude the Leigh Corporation from Golborne being published on Nov. 17, 1900, the Leigh Corporation, on Nov. 23, 1900, decided to lay mains into Golborne. The decision to lay mains was come to merely for fighting purpose. Witness was in the case, and said at the time that the Leigh Corporation ought to buy the Golborne Company out. In December, 1900, and January and February, 1901, mains were laid into Golborne, thus showing what the intention was.

Mr. HONORATUS LLOYD (in cross-examination): You have had large experience in gas matters. Do you know any other case where competition like this exists?

Witness: I do not know any case where they are competing as fiercely as here. Of course, there is the case of the Stockport Corporation and the Hyde Gas Company competing.

Do you know when the Stockport or Hyde Company obtained their powers?—No. Certainly, it is an old business.

With reference to the case of Stoke and Newcastle, in the Potteries, do you know the circumstances there?—I think I do. That is an old business, too.

There is no modern instance in which Parliament has authorized competitive gas undertakings?—No; I do not think there is.

For how many years shall we say?—The last one I am absolutely certain of was in 1869.

That is exactly in accordance with our experience. Are you in favour of competition between gas undertakings?—As a gas company, I should not be. As a consumer in the district, I certainly should be.

That is to say, so long as you have two competing authorities and a rate-war, the consumer is "in clover." Is it in the interest of the consumer in the end that statutory undertakings should be conducted on that basis?—Yes; in the case of two standard-price companies, I do not think it affects the consumer in the end one iota. They cannot come down on the consumer for dividends lost in the past, as a maximum-price company would do.

As a matter of general policy in regard to statutory undertakings, are you prepared to advocate the authorization of competitive companies to-day?—No; I do not think I am prepared to advocate anything as a general policy. I always deal in these Committee-rooms with the particular case before the Committee.

Has the practice been, where such powers existed, that the undertakings have been districted, or competition got rid of?—They have been districted in London. In other places the matter has been disposed of by the local authorities buying out the different companies.

Have you ever found a gas undertaking supplying outlying districts at a less price than the home district?—No. The case is unique to this extent. It is simply due to the competition.

Is it in the interest of the Long Eaton consumer that if gas is supplied to him at a fair price it should be supplied at a lower price to somebody else?—I do not think it affects him one iota. The Company are not paying their authorized dividend; and they have not done so for a long time. During the last twenty years, they might have divided £20,000 more than they have done.

Why do you suppose 1s. higher standard price was given to the Long Eaton Company in respect of the outlying areas?—I suppose it was to tempt them to go to the outlying districts; but it has never been made use of to that extent. The temptation was first given in 1880; so that for many years even the 1s. temptation offered by Parliament was not successful.

There was no one to induce you to go?—There was no inducement.

Now that the place has increased, and the gas supply has been increased by the Company, there is an inducement to go?—There is a population there, and, of course, an inducement for the Long Eaton Company to go there. The Long Eaton Company would not have gone, and did not want to go; but in consequence of the refusal to agree to districting they were bound to enter into competition sooner or later.

Not wanting to go, they suggested that we should give up certain rights; and because we would not, they came in?—Their not wanting to go was because they did not want competition. Not wanting to go by itself may mean that they would rather not go there at all. But they did not want to go and have the competition and bad feeling which always arises from competition. Continuing, witness said about one-third of the supply of the Long Eaton Company was given to large consumers. Nearly all the mills supplied by the Company were in an area where they could not get the electric light. The capital of the Company was £673 per million cubic feet; but last year they put in considerable stoking and coal-handling machinery, which ran up the cost from £602 to the figure stated. This machinery was labour-saving, and would cheapen the gas in the future. The Company, moreover, had been wiping out some dead-capital, and they had spent as much as 12d. per 1000 cubic feet for repairs and renewals. In future, therefore, the price of gas would probably come down over the whole area. Inasmuch as the Draycott Company had been over-capitalizing, and had not spent enough out of revenue on maintenance and renewals, the price of their gas would rise. The Long Eaton price in the competitive district would not be altered unless the Draycott Company changed theirs.

If the forecast you have given is correct, there is all the material for successful competition in your hands, and all the material for unsuccessful competition in ours?—No. You have a big area. You keep all your consumers in Draycott, and you have all the large consumers with you. I do not see why you should not pay your way, though I do say I think the large dividends will be reduced.

Further cross-examined with regard to the expenditure on wear and tear, witness remarked that the Company had kept their accounts "funnily." They had a small amount of unaccounted-for gas, such as no company ever had. He had no desire to attack the Company. Questioned as to what the premiums of the Draycott Company had to do with the Long Eaton Company, he remarked that he supposed the Draycott Company came to Parliament posing as an injured innocent; and, after all was said and done, they had not been quite so innocent. The Draycott Company were trying to affect the Long Eaton Company, and the latter therefore had a right to retaliate. According to the accounts, some of the premiums had been spent "in connection with improvements;" and the language distinctly suggested that the money had been spent on renewals. If Mr. Derbyshire said the portion of the premiums spent had all been expended on extensions,

he would accept the statement. The portion unspent remained in cash; but it was in the wrong position. If the Company put this portion in a fund which was only recognized as a fund for helping dividends, they must expect to be criticized. He suggested, not that a farthing of it had been spent in dividend, but that it could have been used, from the fund in which it was placed, for this purpose. The Company must have intended it to be employed for the purpose, because they put profits to the fund. On April 10, 1907, the Long Eaton Company passed a resolution as follows: "If consumers wish, we will undertake to supply at 2s. for two years certain; and at no time will it ever be higher than at Long Eaton." On April 11, the Draycott Company sent out a circular saying their top price was 2s. 6d.

Mr. HONORATUS LLOYD: Was that our beginning the rate-war?

Witness: I think it rather points to the fact that it was. I will tell you why. If you had known that the Long Eaton Company had passed that resolution, you would not have offered gas at 2s. 6d., but at 2s.

In fact, we did offer it at 2s. 6d. You say that is our beginning the rate-war, because if we knew what we did not know we should have done something else?—Certainly.

Mr. HONORATUS LLOYD: I give you up.

Witness: You knew nothing of that resolution. It had not been issued to the public.

Mr. BALFOUR BROWNE (re-examining): When they pledged themselves to reduce to 2s. 6d., they did not know we were going to reduce, and therefore they began it?

Witness: I am certain they could not have known, or they would have gone down to 2s. It is very curious that the prices in the Long Eaton circular of April 11 are in every case, for lighting, a trifle below the prices which rule now in Long Eaton. It is, therefore, absolutely certain the Draycott Company knew nothing about the resolution.

The proposal is that you, who can make gas cheaper, should be turned out, and the consumers therefore be handed over to a Company who produce dearer gas?—Yes.

Do you think that is in the interests of the consumer?—Certainly not.

In your view, is this a Bill to preserve the Draycott dividend?—Yes.

Is it in any way in the interest of the consumer?—No; it is in the interest of the 25 per cent.

Mr. *Arthur Valon*, examined by Mr. HUTCHINSON, gave evidence as to the expansion of Long Eaton in the direction of Draycott, and said it was quite natural that the Long Eaton Gas Company should follow that expansion. The whole of Breaston would be much more naturally supplied from Long Eaton than from Draycott. The history of gas lighting since the introduction of electricity showed that competition of some kind was necessary in order that the consumer should get the benefit of cheaper gas. As a gas engineer, he regarded the result of the negotiations between the two Companies in this case in 1888 and 1901 as a parliamentary bargain. The competition in the Draycott area had not affected the consumers in Long Eaton, because the Long Eaton Company were able to pay a considerably higher dividend than they were paying. Instead of paying this increased dividend, they had reduced the price of gas in the Draycott area. If the competition were to cease, it would not mean necessarily that the price of gas would go down in Long Eaton. Being a long way within their parliamentary limits as to dividend, the amount of the loss, if any, in Draycott could have been paid away in dividend. Undoubtedly the existing state of things had been of advantage to the gas consumers of Draycott. If the competition of the Long Eaton Company ceased, the price of gas there was bound, he thought, to increase. According to the analysis of the Draycott gas accounts for 1906, the net cost of gas in that year was 15·66d. per 1000 cubic feet. The total repairs for the year amounted to 1·88d. On the average, 6½d. at least was necessary. If an adjustment on this basis was made, the cost would be 20·28d. To ascertain the price at which gas could be sold, the charges for dividend—11·33d.—must be added, making 31·61d. per 1000 feet. A large proportion of the gas was sold for power purposes; and, owing to the competition of other methods of obtaining power, the price of gas sold for power had to be kept down, so that the charge to the ordinary consumer would be higher than the average. The average price in 1906 was 2s. 4·13d. per 1000 feet, and the price to ordinary consumers 2s. 10d.—or 6d. more. If the average price had to be raised, as already shown, to 2s. 7·61d., assuming the same difference between the average price and the price to the ordinary consumers, the charge to the ordinary consumers would be about 3s. 2d. This was on the basis of the standard dividend of 10 per cent. As the standard price was 4s. 6d., the dividend could be increased by 4 per cent. when the price was 3s. 2d. Thus there was a direct inducement to the Company to raise the price still further, if they could increase profit by adding to the price. The dividend of 10 per cent. paid in 1906 was only possible because the repairs and maintenance were very low, which amounted indirectly to paying dividends out of capital. He agreed with Mr. Stevenson that putting premiums to a reserve account was totally unauthorized by the Acts of the Company. The cessation of competition would affect the consumer detrimentally. No injustice would be done to the Draycott Company by leaving matters as they now stood. On the contrary, if the Long Eaton Company were excluded, injustice would be done to those who, upon the faith of the provision enabling the Long Eaton Company to extend into the competition area, provided capital for the Long Eaton undertaking. Probably the fairest way to meet the existing condition of things, and the best way for the consumers, would be that the larger Company should absorb the smaller, at a fair price, of course. It would be far better for the consumer, however, to leave things as they were now. If it was desired that there should be but one Company, the proper way was for the Long Eaton Company to buy out the other concern. He confirmed Mr. Stevenson's evidence with respect to the accounts of the Draycott Company.

Cross-examined by Mr. HONORATUS LLOYD: In case of a purchase of the Draycott Company, the fact that there were duplicate mains, and that the consumers had been canvassed, might depreciate the value of the property considerably. The Draycott Company were formed with competing powers. There was competition, and this certainly ought to be taken into consideration in fixing the value. The price of 2s. per 1000 feet was not a commercial price for the Draycott Company. It was lower than the Draycott Company could continue to supply at. He had never heard of a case in which a company had been forced to reduce their price by another company supplying in competition at a lower price than that other company charged at home. Questioned with regard to the fact that neither consumers as a class nor a local authority claiming to represent the consumers had appeared to say the proposal of the Draycott Company was against the interests of the consumers, witness said they might not realize the result of the proposal; very probably they did not. If there was no competition, he did not think the price of 2s. would continue. In a reasonable time, the price would come down to 2s.

Mr. *W. Newbigging*, examined by Mr. HUTCHINSON, stated that the consumer had benefited by the competition that had taken place; and he saw no reason, from the consumers' point of view, why, for the benefit of the Draycott Company, the existing condition of things should be changed. From the point of view of a gas engineer representing a gas company, competition was more or less harmful; but from the point of view of a gas engineer representing the public it was not.

Cross-examined by Mr. HONORATUS LLOYD: He had not any charge to make against the Draycott Company's works. When he visited them three or four years ago, they were more or less in course of reconstruction. The Draycott Company had done really good work for themselves and, of recent years, for the public also. They had recently been supplying at very moderate prices—prices which compared most favourably with those of any of their neighbours.

Re-examined: The Long Eaton Company had also been supplying at moderate prices.

This concluded the evidence.

Thursday, March 26.

Mr. BALFOUR BROWNE, on behalf of the Long Eaton Gas Company, asked the Committee to reject the Bill. This was, he said, a gas managers' Bill; and the gas managers who had been called for the promoters had a little lost their heads. One—Mr. Woodall—had characterized the competition that had taken place as "scandalous and disgraceful;" while Sir George Livesey regarded it as "atrocious." Gas managers did not like competition; but they did like monopoly. The public derived considerable advantage from competition, within proper bounds. It was true, however, that when competition was unscrupulous it might really be a disadvantage to both companies, and no great advantage to the consumers. It was clear from the evidence that the cutting process was begun by the Draycott Company, though he would not say that both parties had not made up their minds independently to cut prices. Reduction of price was inevitable when there was competition. It was suggested by the promoters that something improper was being done by the Long Eaton Company to their consumers by charging lower rates in the competitive area than at home. The *tu quoque* was never a good argument; but, as a fact, the Draycott Gas Company were doing the same. It was important to remember that, in relation to gas charges, there was no equality. There were very strict obligations on electric light and railway companies not to give undue preference; but gas companies, in the absence of an equality clause, were not bound to treat all consumers alike. Therefore, when the Long Eaton Company found the promoters were going to have a war of rates, they were bound to reduce their charges. The strong language to which he had referred was quite inapplicable here. The Long Eaton Company had merely used the ordinary methods which must be employed when two companies were competing; and the consumers were benefiting in consequence. It would be very hard on those consumers to take away the petitioners' rights of supply, and make the public suffer by leaving one Company with a monopoly. It was not the fact that the Long Eaton Company were protected in Long Eaton; and this fact was the reason they had to seek "fresh woods and pastures new." They were in active competition with the Local Authority's supply of electricity. If Parliament recognized competition between an electric illuminant and gas, why should Parliament say: "We will not allow gas to compete with gas?" Where was the principle? All over London competition between gas and electricity was fierce. And was not London better off in consequence? In the Draycott area, there was no such competition. When the Long Eaton Company first thought of entering this area, they intended to charge exactly the same rate as in Long Eaton; and he was quite prepared now to say they would charge the same rate all over the district if the Committee thought it desirable, and if the Draycott Company would do the same. If, however, they, exercising statutory powers, had to compete with a Company who could lower their rate, they (the Long Eaton Company) must be equally free. The Draycott Company took their powers knowing that at any moment competition might be established. At one time the Company proposed to promote an Order saying the powers of the Long Eaton Company were not to be exercised. The latter Company wrote to them, and they abandoned the idea. This was a parliamentary bargain; and so recently as 1901, in connection with the Bill promoted by the Long Eaton Company in that year, Parliament recognized that there were concurrent powers in the area. The fault was all with the Draycott Company. They had power to supply since 1888; and in 1901 they had not laid a pipe in some parts of their area. In accordance with the present action of the Draycott Company, the Long Eaton Company might have asked Parliament to turn them out of these parts; but they never thought of doing anything so monstrous. Their action, however, was a warning that they intended to supply. In these circumstances, he thought the attitude of the Draycott Company would bear harder epithets than "atrocious" or "scandalous." It was an absolute breach of a parliamentary bargain solemnly made and solemnly confirmed in 1901. Would the Committee take away statutory powers which had been exercised? That was the important feature of the case. Failure to supply for a long period could not be alleged against them; and they asked Parliament to protect them and their rights. The contention that the competition would kill the Draycott Company could not be sustained. The case which had been cited as a precedent for what was here proposed was said by Mr. Woodall to be an exactly parallel one. He (Mr. Balfour Browne) called it a right-angle case;

it was absolutely different. The Golborne Gas-Works were erected in 1855, or six years before the Leigh Company was even incorporated. The Draycott Gas Company was started seven years after the Long Eaton Gas Company. The Leigh Corporation informed the Golborne Company that they would not supply gas in Golborne. The Long Eaton Company preserved their right to supply gas in competition in 1901; and the Draycott Company agreed not to repeal the Long Eaton Company's powers. The Leigh Corporation encouraged the Golborne Gas Company to reconstruct their works, and even allowed their own Engineer to advise the Company and carry out the works. The Long Eaton Company had never departed from their original position, and had not done anything, so far as he knew, to encourage the Draycott Company. The Leigh Corporation in 1900 laid a small main past the turning to Golborne, and no junction was put in for Golborne. The Long Eaton mains in the competition area were laid in 1905; thus showing the Company's intention to supply the area long before this Bill was thought of. After the notice of the Golborne Bill had been published, the Leigh Corporation decided, in December, 1900, to lay a main in Golborne, merely for fighting purposes. Some months before the Long Eaton Company heard of the intention of the Draycott Company to go to Parliament, they ordered the pipes so as to supply the Draycott district. In these circumstances, there was no parallel between the Golborne and Draycott cases; there was no precedent, and the Committee should not make one. He asked them to say they would not be parties to confiscation of property or to rendering it valueless, when it had been put into a district under the powers and sanction of Parliament. He did not want to say anything against the Draycott Company so long as they kept within their proper sphere; but they could not overlook the fact that the Company were over-capitalized in the first instance, and were paying enormous dividends on the real amount of money invested. They had not properly dealt with the premiums, and had issued cumulative preference shares when they had no right to do so. The Committee should protect the Long Eaton Company on the ground that the public benefited by competition. If the powers of the Company were to be taken away, provision should be made for full compensation being paid. It was not proposed to pay a farthing for the money the Long Eaton Company were receiving or for money (over £3000) they had sunk in mains in the Draycott area. He did not know of a case where confiscation such as this had taken place. The Bill was, so far as he could see, an attempt to rob the Long Eaton Company of rights secured to them by Act of Parliament, without one tittle of compensation; and he therefore urged the Committee to refuse to pass it.

Mr. TALBOT, in replying on the case, said that the competition of the Long Eaton Company was not only most inexpedient, but unscrupulous and *malâ fide*. Apart from any question of misconduct or sharp practice, or whatever the action of the Long Eaton Company might be called, this was a case in which Parliament should, on the application of the Draycott Company, put an end to the concurrent powers. It was admitted that Parliament for the last forty years had uniformly discouraged competition in connection with gas; it having been demonstrated that it injured both company and consumer. Particularly was this the case where the sliding-scale was in force; the effect of the sliding-scale being to make consumers and shareholders partners in the undertaking, so that whatever injured one injured the other. Really the one point against the Bill was the fact that concurrent powers—on paper, it was true—had long existed. In a case, however, in which one company had, and the other company had not, entered a district, and established itself there as the gas supplier, he submitted that Parliament should consider that the time had come when it must carry out its usual principles—end the concurrent powers, and leave the occupying company (the Draycott Company) in the position in which nearly every gas company was—namely, the position of a regulated, controlled monopoly of the gas supply of the district, with a sliding-scale. Why was this district to be an exception to the universal rule? Why was it to be expedient here, and to be inexpedient everywhere else, for gas companies to be allowed to compete? While the Act of 1888 left the two Companies power to supply in this area, it was significant that the Act contained no clause for the protection of the Long Eaton Company. Was it conceivable that if, in 1888, the Long Eaton Company had had any serious intention of supplying in the district, they would have allowed the Bill to pass? Undoubtedly if they had done such a thing they would have been guilty of the grossest folly. Who ever heard of a gas or water company allowing another company to come in and obtain concurrent powers over a part of their district which they were able and willing to supply. On the other hand, the predecessors of the present Draycott Company, who were the promotors of the Bill, had not acted with the greatest possible wisdom, for they did undoubtedly take a certain risk. Obviously, although the risk of competition was not then serious, yet, until the Draycott people had occupied the district and could show that they were meeting the needs of the consumers, they were always at the risk of the Long Eaton Company coming into a part of the district which they were not supplying, and of a vexatious and difficult contest as to the division of the area. But this difficulty had been surmounted; and before the invasion the Draycott Company were, and were now, in a position to do everything that a gas company could be required to do to the satisfaction of practically every consumer. With regard to the alleged bargain, he held that the question before the Committee was not what was done in 1888 or 1901, but the present position. Parliament in 1888 left the two Companies with power to occupy the competitive area. One had occupied it, and the other had not. Both had their chance. The Draycott Company had used theirs and the Long Eaton Company had not; the reason in the case of the Long Eaton Company being, no doubt, that they were so well occupied in their home district that they did not care to go far afield. They exhausted their capital in supplying the area. But they had twenty years; and if during the whole of this time they had wanted to supply Breaston and Draycott, they could easily have come to Parliament for further capital. The real fact was stated by Mr. Stevenson—namely, that they did not want to go outside. This showed that the invasion was not a *bonâ fide* attempt to develop the area, but an act of war. It was not undertaken to meet any public need, but to get rid, on advantageous terms, of a company who had a profitable business. It was suggested that the case of Golborne was not at all analogous. An absolute analogy could never be obtained; but every point of distinction between Golborne and the present case was in favour of the Draycott Company. In the Golborne case, the Company who applied to exclude the Corporation had no statutory powers. Parliament actually gave the Company in that case powers to turn out the Leigh Corporation, evidently concluding that the Corporation had made an invasion, not for the purpose of supplying the district, but in order to keep the other Company out—a conclusion which might be legitimately inferred from the facts in the present case; and Parliament did not allow any compensation in that case. Could anyone doubt the real object of the competition of the Long Eaton Company? What was the meaning of the difference between 2s. 8½d. and 2s. per 1000 cubic feet, if it was not a deliberate attempt to crush out the Draycott Company? If the Long Eaton Company could charge 2s. 8½d. in the district where they had to meet the competition of the electric light, how could it be a commercial proceeding to charge 2s. in one where there was no electric light? Of course, the Long Eaton Company were going on at the non-productive rate until the Draycott Company were crushed out, when they would resume the practice of charging a commercial price. Assuming competition was good, would it be secured by the rejection of the Bill? Was it not certain that the effect of rejecting the Bill would be that one of the Companies would go to the wall? The Draycott Company could not, in the competition area, charge an uncommercial rate for a long time, because they depended upon their rate; but the Long Eaton Company could—at the expense of their much more numerous consumers in the Long Eaton district proper. This was what made it certain that the existing competition, if allowed to continue, would end in the establishment of a monopoly in the wrong hands. Regarding the assertion that the cut-rate was commenced by the Draycott Company, Counsel declared that the reduction to 2s. 6d. per 1000 feet was made in pursuance of their ordinary policy of lowering the price of gas which had been pursued uninterruptedly for a very long period. They never issued a circular notifying a reduction to 2s. They went to every consumer who had been got hold of, or was being tempted, by the Long Eaton Company; and, in order to keep out the Company, offered to reduce their price to 2s. That there was general contentment with the Bill was shown by the fact that there had been no complaint from the Local Authorities or the consumers. On general principles, he submitted that the time had come when the anomalous and inconvenient competition should be ended. Even apart from general principles, the way in which the rival Company had behaved rendered such a course desirable; their action not being directed to the welfare of the district, but to the crushing out of the existing Company, and acquiring the undertaking at the low value to which it would be reduced if the competition were successful—the consumers, in that case being saddled with the burden of the capital wasted in the process.

THE COMMITTEE'S DECISION.

After a short deliberation by the Committee in private,

The CHAIRMAN said: The Committee are not very strongly impressed with the argument that competition is for the benefit of the public. In this case, apart from the consideration that if things are left as they are competition would probably come to an end by a natural process, we have what we regard as the established practice of Parliament, which is against allowing competitive supply in any one area. That being so in this case, there are two Companies who have had what are called concurrent powers. The Committee consider that concurrent powers are equivalent to equal opportunities for each Company to develop the business of supply within the same area. One Company have, until the last few months, neglected to avail themselves of these opportunities, whereas the other have, in the course of time, established a prosperous and, we consider, a satisfactory business of supply; and the Committee are of opinion that the Company in that position are entitled to claim to be confirmed in the area in which they have developed their business. That being so, the preamble of the Bill must be taken as proved, and the Bill will proceed. In considering the area of the Draycott Company, we have felt that at the east end of that area there is a portion of the territory to which the Long Eaton Company may have established a claim to have extended their works; and the Committee would wish to alter the boundary of the area by a line which should be drawn at a point just west of where the two small mains were laid by the Long Eaton Company in 1905. We consider that the territory to the east of that line is possibly territory which would be developed in course of time from Long Eaton, and that if the area of supply of the Draycott Company is confined to the westward of that line, substantial justice will be done. With regard to the other mains that have been recently laid by the Long Eaton Company, we propose to follow the precedent in the Golborne Act. I understand that the rights of the Long Eaton Company to a main to enable them to reach Risley through the Draycott area will be preserved.

Mr. BALFOUR BROWNE stated that probably he would not take any further part in the proceedings, but he would like Counsel for the Bill to show him, as a matter of courtesy, the line which was proposed to be drawn.

Mr. TALBOT assented.

The Committee thereupon adjourned. On re-assembling,

Mr. TALBOT intimated that Counsel for the Long Eaton Company had not thought fit to meet them, and therefore the promoters had, on their own responsibility, brought up a cartoon marked with a line to carry out the decision of the Committee. He did not pledge himself that the line would be the one which would be finally decided upon; but the promoters would have triplicate plans prepared showing the line adopted, and these would be signed by the Chairman of the Committee, and referred to in the Bill. Counsel added, in reply to the Chairman, that the line did not follow any natural boundary, inasmuch as there was no such boundary to follow. It was a purely arbitrary line, as, in fact, was the boundary of the whole of the area of the Draycott Company.

The Committee accepted the line, subject to the production of the triplicate plans.

The clauses were then gone through and adjusted in accordance with the decision of the Committee.

FINCHLEY URBAN DISTRICT COUNCIL BILL.

Interference with Water Company's Valves, &c.—Clause Struck Out.

Police and Sanitary Committee of the House of Commons.

Wednesday, March 18.

(*Before Mr.* CORRIE GRANT, *Chairman*, *Captain* GUY BARING, *Sir* GEORGE FARDELL, *Mr.* ERNEST GARDNER, *Mr.* JOWETT, *Mr.* VINCENT KENNEDY, *Mr.* LAYLAND-BARRATT, *Mr.* MANFIELD, *and Mr.* C. N. NICHOLSON.)

The above Committee had before them to-day the portion of the Bill of the Finchley Urban District Council which contains a clause by which the promoters seek powers to turn on, in case of fire, the valves and the hydrants of the Barnet District Gas and Water Company supplying their district. The part of the Bill which contained the Council's electricity powers was dealt with in the "JOURNAL" last week (see p. 775).

Mr. RAM, K.C., and Mr. VESEY KNOX, K.C., appeared for the promoters. The petitioners in opposition on this portion of the Bill were the Barnet District Gas and Water Company, who were represented by Mr. BALFOUR BROWNE, K.C., and Mr. A. M. PADDON.

The clause (85) dealing with the interference with the mains of any Company supplying water in the district of the Council was as follows:

> The captain or superintendent of the Fire Brigade of the Council, or other officer of such Fire Brigade for the time being in charge of the apparatus for extinguishing fires, may open any hydrant, valve, or other apparatus of any water company or authority necessary or proper for the supply of water in case of fire.

Mr. VESEY KNOX said this was an entirely new clause; and it was only opposed by the Barnet Gas and Water Company. This Company obtained their water from wells; and no doubt, owing to the varying levels of the district, the pressure had been the subject of complaint at various times. There had been in many cases a deficiency of water at fires. By a recent Act, however, the Company were under obligation, on the completion of new works, to give a continuous supply; and the Council had reason to hope that in future there would be a sufficient supply in the mains. The Council had provided hydrants in various places, and were entitled, under the general law, to open them—at least, that was their contention, although the matter was not very clear—but the Company had put on governing valves, apart from the valves attached to the hydrants. Thus, when the Council opened a hydrant, and even the valve near the hydrant, they could not get water, because they could not open the governing valve. It had actually happened that when the Council had broken the law and opened such a valve, the Company's turncock had turned the water off and allowed a building which was alight to burn. There could hardly be a more special case for the amendment of the law.

Mr. PADDON: That is a very serious statement; and it is contrary to my instructions.

Mr. VESEY KNOX said he would prove it. The Council ought to be able to open such valves or apparatus as might be necessary to obtain a supply of water in case of fire. The Home Office suggested that if the clause were allowed, the words "attending at any fire within the district" should be inserted after "extinguishing fires." These words had been inserted. In order to meet the Company, the Council were also willing to insert:

> Provided that (1) such officer shall notify the occurrence of the fire to the nearest resident turncock of such company or authority. (2) It shall be the duty of such officer, or the turncock (if he has arrived), to close such hydrant, valve, or other apparatus when water for the extinction of the fire ceases to be required. (3) If such officer fails to close such hydrant, valve, or other apparatus, when it is his duty so to do, he shall be liable to a penalty not exceeding £10.

This would give the Company all the protection they ought to require. The Company stated that the levels in the district varied from 166 to 425 feet above Ordnance Datum; and part of the district was supplied by pumping direct from the Company's pumping-stations at Barnet or elsewhere. It was accordingly of very great importance, they urged, that the control of the valves in their mains should be retained in their hands, "else disastrous consequences might follow a manipulation of their valves while such pumping was proceeding." He did not apprehend that they had so constructed their works that it was dangerous to take water from the mains in case of fire. Every water company was under obligation to provide water which could be used in case of fire; and if their apparatus was so constructed that the valves could not be opened so as to give a supply in case of fire, the sooner they altered their apparatus the better. The Company in their petition made the request that they should be "relieved from penalty by reason of the reduction of pressure occasioned by the opening of such hydrant or valve, and their inability to supply water at the pressure prescribed, and that the Council and their officers should be subjected to a reasonable penalty in the case of their opening without the consent of your petitioners any hydrant, valve, or apparatus of your petitioners except for purposes of extinguishing fire, or in the case of their wilfully or carelessly failing to close any hydrant, valve, or apparatus opened for such purpose." He did not see how the Company could ask that, if the general law subjected them to a penalty, it could be claimed, even when the immediate cause of the interruption was the use of water for fire, that they should be free from the penalty when the valves were opened by the Council. Any obligation of the Company under the Water-Works Clauses Act would not be affected at all by such a matter. The clause would only give power to open the apparatus in case of fire; and the proposed additions would provide that it was to be closed when the fire had been overcome.

Mr. *Alfred Sly*, Chief Officer of the Council Fire Brigade, examined by Mr. RAM, said the Council had, at their own cost, provided a large number of hydrants. The water entering the hydrants was controlled by valves in the Company's system. The right to open the valves had always been a disputed point. The Company asked that one of their turncocks should be called to open the valves, and that the officers of the Council, in case of fire, should not have the right to do so. All the turncocks were in electrical communication with the Central Fire Station; and when the firemen were called to a fire, the turncocks were called simultaneously. In regard to a fire which occurred on Sept. 3, 1906, witness, in the course of his report to the Council, mentioned that when the hydrant was opened the water only dribbled from the nozzle. Being aware that a good supply could be obtained from this particular hydrant, he requested the turncock to open the valve and give a better supply. He would not do this, so witness opened it himself. Being called to another fire, directly the brigade had gone it was shut down to a dribble, which allowed the fire to spread. Witness returned, and again opened the valve; but the turncock went elsewhere, and must have shut down another valve, as there was hardly sufficient water to extinguish the fire. A similar case occurred about six years ago. There was a great deal of trouble between the Council and the Company. The Company were going to prosecute witness for opening the valve. Turncocks were not always at home to be communicated with; and whenever one was not at a fire, it invariably happened that the water was not turned on right through. In such cases, they had to wait till the turncock was notified by someone; and, pending his arrival, the fire was going on.

In cross-examination by Mr. BALFOUR BROWNE, witness said he could not refer to any Act in which such powers as were now being sought could be found. The Council had an engine with which they could provide their own pressure. What they wanted was water enough to be able to use the engine.

Mr. BALFOUR BROWNE: Suppose we were pumping, and you closed the valve against our pumping, would not the result be an immediate burst?

Witness: I do not think so.

Do you know of any system where pipes will stand against pumping, if the pump is sufficiently strong, if the valve is closed?—Well, of course, if all the valves were closed. But I could not close them all at once.

Replying to further questions, witness said he did not know of a case in which one of the Council's men turned on a valve and left it open, with the result that the Company lost about 230,000 gallons of water.

The CHAIRMAN asked if the Council had communicated with the Company with regard to the two cases of difficulty to which witness had referred.

Mr. RAM replied in the affirmative. There was a minute to that effect.

The CHAIRMAN: But a minute will not do. You must produce the letter.

Mr. BALFOUR BROWNE said his clients knew nothing whatever about the letter.

On the Committee re-assembling after the luncheon adjournment,

Mr. BALFOUR BROWNE said he had seen an officer of the Company, who told him that the fire was not in a house. It was a field or hedge that was burning; and apparently the turncock thought it more important that the district should be supplied. He therefore turned off the tap, went away, and, on returning, turned it on again.

Mr. RAM: I do not think I can carry it further.

Mr. BALFOUR BROWNE, in addressing the Committee on behalf of the Company, pointed out that this incident occurred in 1906, before the constant supply was laid on in the district. It was extraordinary that, although there were about fifty fires a year in the district, there had been only the two complaints referred to. The proposed clause was an entire departure from the general law, and both the Local Government Board and the Home Office had called attention to it. In the Fire Brigade (Metropolis) Act, 1865, which applied to London—a far more important area even than Finchley—it was provided that the chief or other officer in charge of the fire brigade might, for the purpose of putting an end to a fire, "cause the water to be shut off from the mains and pipes of any district." The officer was not to take the valves in hand himself, but was to cause it to be done by the turncocks. The Barnet Company were perfectly willing to accept a similar provision. Under section 89 of Public Health Amendment Act of 1907, the officer in charge of the fire brigade of a local authority which was attending a fire was given sole charge of all operations, including the fixing of the position of apparatus, the attaching of hose to any pipes or water supply, &c. No power, however, was given to touch valves. The danger of doing so would be very great. The Company pumped with enormous force. Sometimes four engines were working; and shutting down a valve would inevitably mean breakage and bursting of pipes. Yet it was not proposed that the Company should be in any way relieved of responsibility. Under the Act of 1865, to which he had already referred, after saying that the Company's water might be cut off, it was provided that "no water company shall be liable to any penalty or claim by reason of any interruption of supply occasioned only by compliance with the provisions of this section." It would be monstrous that the Company should be bound to supply water at a constant pressure, and that powers should be given to the Council to touch the Company's valves and take away the whole pressure, and yet that the Company should be liable to penalties. It was absurd to suppose that when the valves were opened the Company could maintain the same pressure as when they were closed. This case went beyond any precedent; and he asked the Committee, therefore, to reject the proposed clause.

Mr. RAM said there might be danger in turning off a valve; and the Council were therefore prepared to modify their proposal to meet that point.

After further discussion,

The CHAIRMAN said: The Committee think there is no case made out for this particular clause. There has been a single fire in a field; and the Council evidently do not attach very much importance to it, or else we think they would have been prepared with the evidence much more promptly than they were. We must not base extensions of the law on any single instance in any case.

Clause 85 was accordingly struck out.

SLOUGH WATER BILL.

The Bill promoted by the Slough Urban District Council for the compulsory purchase of the Slough Water-Works was last week before the House of Commons Committee presided over by Sir HENRY KIMBER.

Mr. WEDDERBURN, K.C., and Mr. F. N. KEEN appeared on behalf of the promoters; and Mr. BALFOUR BROWNE, K.C., Mr. HONORATUS LLOYD, K.C., and Mr. R. S. CLEASE for the Slough Water Company.

Mr. WEDDERBURN, in opening, said that this was a question solely between the Urban District Council of Slough and the Water Company whose works they desired to buy up, and who were adopting the usual attitude of no consent. He contended that the trend of parliamentary policy and principles for a good many years had been that the water supply should be in the hands of the sanitary authority for the district rather than in those of a dividend-earning company. Water was the only thing for which people paid by a tax—that was, they paid for the domestic supply of water according to their power of payment gauged by the class of house, and not according to the amount used. The position of a water company as a taxing authority was not as consistent as the position of a local authority. There were at the present time 1373 water undertakings in the United Kingdom; and 1142 of these were in the hands of local authorities. The Slough Water Company was formed in 1868, under an Act of Parliament. All the shares were privately held, and the concern remained for a long time a purely private undertaking. In 1874, the chief owner died; and the Company were then desirous of selling to the Local Authority. The Company went for an Act of Parliament in 1874, and included in the Act power to sell by agreement to the Local Authority. In 1901, the Company obtained a Provisional Order sanctioning additional capital, and in 1906 another Provisional Order with further capital. Counsel then quoted the Sheffield Corporation Act of 1887, and the Harrogate, Fylde, Llandrindod, and Southport cases, as precedents for the proposals of the District Council. He did not make any complaint in regard to either the quantity or the quality of the water; but there was some feeling in the district that the charges were too high. The Company supplied the Slough Urban District Council and the Eton Rural District Council, who supported the Bill; the Urban District Council having agreed that 10 per cent. of the profit, after paying interest and sinking fund, should go to the reduction of the water charges in the Eton rural district, and 15 per cent. in reduction of the general district rate, in addition to which water for public purposes should be supplied at 6d. per 1000 gallons.

Mr. *Frank Farr*, the Chairman of the Council, gave evidence as to the general desire of the district that the water-works should be in the hands of the Council. He stated that he took the chair at the meeting under the Borough Funds Act and explained the Bill. A report of his speech was then read, in which he said that it was proposed to ask for 100 years in which to repay the loans, and to suspend the sinking fund for 20 years. This had since been altered; and it was now proposed that the period should be 60 years and the suspension of the sinking fund for five years only. He was strongly cross-examined by Mr. Clease to show that the ratepayers had been misled as to the terms on which the undertaking would be acquired.

Mr. *G. H. Charsley*, the Clerk to the Council, said that the area of the District Council of Slough was 1536 acres, and the present estimated population 14,010. The assessable value of the urban district was £70,390; and the outstanding loans of the Council amounted to £49,178. He was present at the statutory meeting and counted the votes. All those voting were ratepayers. There were 62 who voted for, and 1 against the proposal. The members of the Council present did not vote. At the meeting of the Council to sanction the Bill, 11 out of 12 members were present. Ten voted in favour of the Bill, and one refrained—being a shareholder.

A large number of local witnesses having been called,

Mr. *W. B. Keen* then gave evidence. He said that the balance of the revenue account for 1907 was £4475 10s. 2d. If to this were added Directors' fees and income-tax, the profit of last year available if the Council took the works over would be £4800. The difference in sinking fund due to altering the term from 100 years to 60 years would be £39 11s. 8d. upon each £10,000. The difference in annual charge between suspending the sinking fund for 20 years and not suspending it at all would be £53 16s. 8d. per £10,000. The maximum dividends were £2768; and taking 30 years' purchase of these, adding the debenture debt, and the present value of the back-dividends, would amount to a total of £103,040. Adding 10 per cent. for compulsory sale, £10,304, would give a total of £113,344—a figure which he looked upon as being quite outside what would be given by an arbitrator. In answer to the Chairman, witness said he thought that there would be a chance of risk to the ratepayers having to make up a deficit if the price should amount to more than £120,000.

Mr. *James Diggle* gave evidence with regard to the charges made for water by the Slough Company as compared with the neighbouring undertakings at Windsor and Rickmansworth, and the South-West Suburban Company. He also handed in tables giving the charges for domestic use made by towns where the supply was obtained from wells, and also a list of towns with charges for meter supplies. He said that the charges at Slough generally were very high in comparison with other towns. From his experience it was desirable for the control of water undertakings to be in the hands of the sanitary authority. If transfer took place, he thought that the only charge that there could possibly be on the ratepayers in the first few years would be the payment of the costs of the Bill. Afterwards they would either be able to make a very substantial reduction in the rates for water by reason of the large yearly increase in the income, or, if they levied the charges put in the Bill, they would in a few years be able to pay a considerable sum towards the relief of the rates.

Mr. *W. A. M'Intosh Valon* said he was of opinion that the supply of water, being necessarily a monopoly, should be in the hands of a public authority in preference to a private body. It differed from gas in that there were other methods of obtaining both light and heat; but there was no substitute for water. He also gave evidence as to various transfers in which he had been engaged, and the results when the undertakings were in the hands of the local authorities. The effect of the sinking fund was to enable reductions in charges to be made as the capital was reduced. In the history of every water undertaking, extensions of supply works had to be provided at some time; and when the works were in the hands of the local authority they were more likely to be provided in time, as the company would have to look to the effect of the outlay upon their dividends.

Mr. BALFOUR BROWNE then addressed the Committee on behalf of the Company (who called no witnesses), and submitted that no case had been made out for the Bill. He contended that there was no precedent for expropriating the Company upon the ground of general policy. The ratepayers had not given their assent to the Bill as it was placed before the Committee. He next dealt with the various precedents that had been quoted by Mr. Wedderburn in his opening speech, and contended that they were not on all-fours with the present case.

The CHAIRMAN said that the Committee had come to the conclusion that, unless some precedent could be shown them for compulsory purchase under similar circumstances, they could not pass the Bill. They were not quite satisfied upon the cases of Fylde, Kettering, Southport, and Filey. The Committee recognized that it had been a matter of public policy for the water supply of places to be under the care of local authorities; but they had some doubt whether this young authority had sufficient experience. Still, if they were willing to try to come to terms with the Company, they would be disposed to pass the Bill, subject to its going back to the ratepayers for the acceptance of the figure. The Committee thought that if the Council offered such a sum in Consols, or its equivalent in cash, as would produce in dividends the £2768 (the total maximum dividend now paid), besides the back-dividends which they were entitled in any case to be paid, 10 per cent. for compulsory purchase, compensation to officers and Directors, and to take over the loan of £5000, they would be inclined to pass the Bill subject to the ratepayers' consent. If the Company did not accept the offer, the Bill could not be allowed to proceed.

The Committee adjourned until to-day.

Dartford Gas Bill.

The Unopposed Bills Committee of the House of Commons presided over by Mr. CALDWELL gave consideration on Thursday to the Dartford Gas Bill.

Mr. Hayward, the Solicitor to the Company, having proved the preamble, the Agent for the Bill (Mr. Cameron) stated that the object was to consolidate the capital of the Company, amounting to £74,400. The powers to borrow were £18,500; and £12,083 had been raised. They sought to issue further capital of £75,000 ordinary stock. The Local Government Board's report had been met in all respects. With regard to the auction clauses, they only proposed to raise stock; and therefore the word "share" would have to be struck out. The Bill was then ordered to be reported.

Dover Gas-Works Recreation-Room.

The employees of the Dover Gas Company who were unable, owing to being on duty, to attend the entertainment given on the 12th of December last to celebrate the twentieth anniversary of the opening of the reading and recreation room at the gas-works, were invited to a concert last Tuesday, at which the Chairman of the Company (Mr. Willsher Mannering) presided; the Company's Engineer, Mr. Ralph Herring, who is President of the room, being present. In proposing the health of the Chairman, Mr. Herring said he had had a word passing through his mind—one their Chairman used at the shareholders' meeting—the word "Unity." Unity led to success; and all the while they were united in their duties he had no fear as to the success of the Dover Gas Company. So long as they had the honour of serving such employers, their whole energies should be centred on doing their duties thoroughly. He hoped they would never be less united than they were at the present time. He had great pleasure in proposing the health of their Chairman, Mr. Willsher Mannering, to whom they all owed a great debt of gratitude. Mr. Mannering, in responding, said it was one of the greatest pleasures of his life to be associated with them in so prosperous a Company. Unity had enabled the Board to bring the undertaking to its present position; and when he looked round and saw the happy faces of those who had been with them for many years, he felt sure they were satisfied with their employment. It was always a great pleasure to him to be with them on these occasions, as he felt that such gatherings tended to bring them more closely together. Subsequently, the health of the President was proposed by Mr. Mannering, who referred to the great interest Mr. Herring always took in the movement, and his anxiety for the welfare of those under him. The toast was cordially received. A pleasant evening was brought to a close with the National Anthem.

Holderness Water Bill.—Arising out of this Bill, there have been negotiations between the Hull Corporation and the Sculcoates Rural District Council and Hedon Corporation for the supply of water to Preston and Hedon; and these have been brought to a successful issue. An agreement, subject to approval, has been arrived at by the representatives of the authorities to the following effect: (1) That after the expiration of one year the Hull Corporation, on the request of the Sculcoates Rural District Council and the Hedon Corporation, are to give a supply of water in bulk at the City boundary sufficient to meet the requirements of Preston and Hedon separately, or of Preston and the borough of Hedon jointly; (2) the right of the respective Councils to require such supply to lapse if not exercised within three years; (3) no definite pressure to be guaranteed by the Corporation; (4) the Sculcoates Rural District Council and the Hedon Corporation to pay to the Corporation in perpetuity a sum of £37 10s. per quarter, such payment to entitle them jointly and severally to a supply of 1 million gallons per quarter respectively, and any additional quantity required to be charged for at the rate of 6d. per 1000 gallons; (5) in addition, the usual meter-rent to be paid by the Councils, varying with the size of the meter required.

LEGAL INTELLIGENCE.

THE GAS EXPLOSION NEAR HOLBORN.

Liability of the Gaslight and Coke Company.

In the King's Bench Division of the High Court of Justice last Friday, Mr. Justice Grantham and a Special Jury had before them the case of *Cawley v. Gaslight and Coke Company*, which raised the question of the liability of the Company for damages caused by a gas explosion which occurred in May's Yard, Red Lion Square, on July 30, 1906.* The plaintiff alleged that the explosion was caused by the negligence of the defendants' servants in dealing with an escape of gas. Defendants denied negligence.

Mr. HUGO YOUNG, K.C., and Mr. WOOD HILL appeared for the plaintiff; Mr. HUME WILLIAMS, K.C., and Mr. MURPHY represented the defendants.

Mr. YOUNG said the explosion for which the plaintiff sought damages not only caused serious destruction of property, but also resulted in the death of one of the Company's servants and three horses, and injured several others. The Jury would only be troubled with the question of the liability of the Company, as damages had been agreed; and this would depend on whether their servants exercised proper care in doing their work. On the morning of July 30, 1906, the defendants' servants were sent for to repair a gas-pipe which had broken in May's Yard. This necessitated the digging of a trench and the putting in of a bend. After it was finished a man was ramming the earth with an iron rammer, when a spark caused an explosion. The yard was surrounded by coach-houses and stables; and under one of the latter there was an old cellar. On the day before the accident a smell of gas had been detected in the yard; but it was not serious. Next morning it was serious, and Mr. May telephoned to the Company. An inspector came down and looked at the pipes, and men were sent to repair them. The yard was paved with granite setts; the pipe running 9 inches below the surface. The men did not take any steps to ascertain whether or not the cellar was full of gas, to ventilate it, or anything of the kind. They simply mended the pipe, hammered a wedge beneath it, and then put back the soil. It was while doing this that the explosion took place. Under the circumstances, he should ask the Jury to say the defendants were liable.

Mr. *Henry May* said he asked the Company's inspector, when he came, if there was any danger; and he said there was not. The cellar-flap was seldom opened.

In cross-examination, witness said he was in the stable on the Sunday morning, and saw a horse pull a pipe out about 4 inches from the wall. The pipe was put back again, and the nails hammered into the wall. When he came back on Sunday night the smell of gas was stronger; but he did not think it necessary to let the Company know that night, as he did not consider there was any danger. The pipe in the wall was pulled out because a man had fastened a horse to it.

Mr. *George May* said the pipe referred to was thin and rusty, and the one that was mended was under the granite setts.

In cross-examination, witness stated that he could not say if the cellar-flap had been opened half-a-dozen times in two years. He did not think it material to tell the Company's men how the leak was caused.

Mr. HUME WILLIAMS said the first indication the Company had of the leak was at 8.30 a.m. on the 30th of July; and an inspector (Mr. Howell) was at once sent to see to it. Mr. May told him he had detected a smell of gas in the open yard. The inspector looked at the pipe and smelt along it, and naturally concluded that it was a case of a small fracture in the open air. Mr. May did not tell the inspector that the flap led to the cellars which were under the stable. As to the explosion, all that could be imagined was based on theory. It was not suggested that the men lit a fire or did anything of the kind. Ramming the earth in, which was supposed to have caused the explosion, was not negligence. It seemed that the negligence suggested was that the Company did not send their men quickly enough, and that they ought to have asked where the flap led to, so as to have found out if any gas had collected there. He suggested that the Company had not been fairly treated, because it was evident Mr. May did not tell all he knew about the smell of gas when the inspector first came. Mr. May knew what had occurred to the pipe on the Sunday morning by the horse pulling it away from the wall; but it appeared he had only indicated to the Company's men that there was a leakage. He allowed the gas to go on escaping for 36 hours, and never told the inspector the material facts. If the Company's men had known all these, not only would great destruction of property have been obviated, but the Company would have saved the life of one of their old and valued employees. Under the circumstances, he suggested that the proper verdict would be one for the defendants.

Henry Waldron, assistant valve man to the Company, said the valve-room was open at the Company's office day and night. There were always fitters ready to go out for repairs. He received a telephonic communication on the morning of July 30, and men were sent out.

Charles Howell said he went to May's Yard on the day in question, and Mr. May told him there was an escape of gas, which he had perceived the previous morning. Witness told him he ought to have sent notice then. Mr. May indicated the spot in the yard where he thought the escape was; and witness found a little gas coming from the ground near the pipe, but it did not seem serious. He thought the gas was escaping into the open air. Mr. May said nothing about the cellar-flap; and witness had no reason to suspect a cellar there. If he had been told that the pipe in the stable had been pulled from the wall on the previous morning, he should have come to the conclusion that there was a collection of gas in the cellar.

Cross-examined: He told May there was no danger; but that was because the escape was in the open air. He did not notice a cellar-flap. If he had known of the cellar being in existence he should have taken further precautions, knowing that the escape had been going on for 24 hours.

Frederick Nunn, a service layer, said when he took the pipe up he found it broken in half under the ground. There was nothing to lead him to suppose gas was escaping from anywhere but the fracture in the pipe.

Mr. *G. F. L. Foulger*, the Chief Distributing Engineer to the Company, said the office was kept open day and night to receive complaints. He had heard the evidence as to the accident. The pulling of the pipe from the wall of the stable by a horse on the Sunday morning would probably break the pipe in the ground. If the Company had been told on the Sunday, or even on the Monday, of what had happened, they would have viewed it as being a more serious break than it was thought. It would have had earlier attention if the men had known the pipe was broken in half. In his opinion, there was nothing in what the men found which should have indicated what had occurred. The Company had a large number of small ground escapes. The men were quite capable of dealing with the break. Where they did not locate a break, they usually found it with a light; and in that case they were always told to be very careful of adjacent cellars. In this case, the break had been found, and no light was used, so the men would not think there was danger. In all his forty years' experience, this was the first time he had ever known of gas being ignited by means of a rammer, An escape of gas into the open air was less serious than one into a house. In his opinion, the rammer used was a proper one to employ in such a case; a wooden one would not be heavy enough. A stopcock which had been put in since the accident was fixed in the cellar under County Council requirements.

Cross-examined: He had no doubt that the explosion was caused by gas getting into the cellar. He would not altogether deny that it would have been a prudent thing to have searched the cellar, in the light of what had occurred. If he had known the cellar was charged with an explosive mixture, it would not have been a prudent thing to let the men use an iron rammer. He did not think they ought to have known the explosive mixture was there. If anyone knew it, the men should have been told.

This closed the evidence.

Counsel having addressed the Jury,

His LORDSHIP summed up, and pointed out that the only question for decision was whether there had been negligence on the part of the defendants—whether the examination was such as prudent men, knowing there had been an escape of gas, would make.

After a few minutes' consultation, the Jury found in favour of the plaintiff; and his Lordship entered judgment accordingly.

* See "JOURNAL," Vol. XCV., pp. 292, 399; Vol. XCVI., p. 116.

TAXATION OF GAS-MAINS IN AMERICA.

The last number to hand of "Progressive Age" contains the decision of the Supreme Court of Pennsylvania in an action brought by the Kittanning Borough against the Consolidated Natural Gas Company. It is of more than usual interest, as it gives the authorities of the borough power to levy an annual mileage tax on the pipes and mains of the Company lying within their limits, and awards the plaintiffs the sum of $1755. The ordinance of the borough under which the tax was levied was as follows: "(1) That every artificial gas company, natural gas company, water company, or other company's mains and pipes within the borough of Kittanning shall be inspected by the Police Department of the said borough at least once in every year, that the same may be kept in safe and proper condition. (2) That each mile of pipes or mains laid or maintained within the limits of said borough shall be liable to an annual licence fee of $30 for each and every mile. (3) That the said licence fee shall be paid to the Treasurer of the borough on or before the 1st day of October of each year, who shall issue his receipt therefor, showing the number of miles of pipes and mains for which the licence is paid." It was contended by the Company that the ordinance was of itself, and apart from all general reasoning applicable to the legality of similarly purposed ordinances, a direct annual tax levied upon specific personal property. It did not even assume the garb of a so-called licence privilege. It was also submitted that, as the tax was levied upon each mile of pipe, a company operating less than one mile would be exempt; and that therefore the tax was not uniform upon the same class. The reply was simply that the tax was lawful, and was justified by a large number of cases cited.

This view of the matter was supported by Mr. Justice Stewart. In the course of his judgment, he remarked that in the cases with which the one before him was supposed to conflict the thing subjected to the tax or fee was the privilege allowed a company in connection with the streets of the borough, and the money realized thereby was to enable the municipality, without cost to themselves, to discharge the duty they owed to the public of exercising proper and reasonable surveillance and inspection with respect to the manner in which the company were exercising their privileges. That such an exercise of power was within the right of the municipality had been decided again and again. The cases in which it had been upheld were those where the licence tax was exacted for telegraph poles on the public highway, and the tax was levied upon the poles and the wires of the company. It would seem to be utterly without reason to say that a municipality might exact a licence tax on the poles and wires of a telegraph company, but not on the pipes and mains of a water company. The logic that allowed it in the one case would compel it in the other. Indeed, considering the frequency with which the public streets were necessarily interfered with by water companies in laying, relaying, and repairing their pipes and mains, there would seem to be much greater reason for the exercise of the right in connection with such companies than with telegraph companies, since the frequency of the disturbance by the former would evidently require a stricter surveillance to secure the safety and convenience of the general public. The assignments of error were overruled, and the judgment delivered by the Court below affirmed.

Slot-Meter Thefts in York.

At the York City Police Court last Wednesday, Thomas Neale (20), a labourer, was charged on remand with two offences of stealing money from slot meters, the property of the York Gas Company. The first offence was alleged to have taken place on the 20th inst., when the prisoner took 5s. from a meter, and in the second case he was accused of having taken 13s. from another meter in the same street within the past three weeks. Evidence was given by an employee of the Gas Company to the effect that he had examined the meter in connection with which the first charge was brought, and found the cash-box empty on the floor, and 5s. 1d. missing. George Burgess, a youth, deposed that on the previous Friday the accused got into a house by climbing over the wall, and returned in a few minutes saying he had about 5s. They went into the city together and had something to eat and some cigarettes. Accused gave witness 1s. 6d. and said he would take 6d. home. A detective proved the arrest of the prisoner, who made no reply to the charge. In the second case, a little boy was the only witness; no other evidence being necessary, as the prisoner pleaded guilty. The Chief Constable suggested that it was a case for exemplary punishment, as there had been a large number of robberies of this character. Prisoner began a downward career in 1897; in that year, in 1899, and twice in 1901, he was convicted of stealing. On the last occasion he was sent for five years to a reformatory, but soon after his discharge he was convicted of breaking and entering. The Chairman (Dr. Petch) said the prisoner's record was a bad one, and it seemed impossible to do him any good. He would be sent to prison for three months, with hard labour, on each charge—six months in all. The witness Burgess was recalled, and the Chairman told him he had narrowly escaped being in the dock alongside the prisoner.

A Water Company's Right to Sink Wells.—Last Thursday, the appeal of the Frimley and Farnborough District Water Company against the decision of Mr. Justice Swinfen Eady, granting an injunction to restrain the carrying out of their proposed new works at Odiham (see *ante*, 636), came before the Master of the Rolls and Lords Justices Moulton and Buckley. Mr. Macnaghten, K.C., and Mr. Cozens-Hardy having argued the case at some length, their Lordships unanimously dismissed the appeal, with costs; the respondents not being called upon.

Impure Water Supply to an Asylum.—In the King's Bench Division of the High Court of Justice last week, Mr. Justice Grantham and a Special Jury had before them the case of *Brown v. Butler*. It was a claim by the widow of the farm bailiff at the Three Counties Asylum, near Arlesey, in Bedfordshire, for damages from Mr. Francis Noel Butler, as Clerk to the Committee of Visitors of the Asylum, for the loss of her husband owing to the alleged negligence of the defendant in supplying to her house impure water, obtained from wells. The hearing occupied several days; and in the result the Jury returned a verdict for the plaintiff, with £650 damages.

Injuries through an Uncovered Plug-Hole.—In the Westminster County Court, on Friday, a claim for damages was made by Mrs. Allard, of Plaistow, against the Metropolitan Water Board, for personal injuries sustained in consequence of the defendants "negligently allowing a fitting in the highway to be defective." Mr. Charles Doughty appeared for the plaintiff; Mr. John O'Connor, M.P., represented the defendants. One night in September last, when the plaintiff was crossing the road in which she lived, the heel of her boot caught in an uncovered plug-hole, and she was thrown to the ground and injured, with the result that she was ill for seven weeks. It was submitted that the defendants were negligent, inasmuch as the lid which should have covered the hole was missing, and a stone was found in the hole, apparently for the purpose of filling it. Mr. O'Connor said workmen had been engaged upon the stopcock box in question the day before the accident, and the lid was broken. A new one was properly fixed and secured, and was seen to be all in order after the workmen had left. He contended that the defendants had not omitted any duty, had been in no way negligent, and consequently were not liable for damages. The lids of stopcock boxes were a constant source of trouble, owing to mischievous children and malicious removal for sale as scrap iron. How the lid disappeared from this box was unknown. Judgment was given for the plaintiff for twenty guineas and costs.

Proposed Gas Supply for Braunton.—A local correspondent writes: "A scheme for supplying gas to the village of Braunton, on the north coast of Devon, appears to be under consideration in London. At all events, an application has been received from a London company by the Barnstaple Rural District Council for permission to open the roads at Braunton if gas-works are erected there. The promoters added that they proposed to charge 5s. per 1000 cubic feet for gas sold to private consumers, and that the charge to the Council as a public body would be 4s. 6d. The Rural Council referred the matter to the Parish Council. Braunton is a small place; but in summer it attracts a fair number of visitors. Its demand for gas would probably be very small."

Swinton Council and the Gas Bill.—Some of the members of the Swinton Urban District Council have been much exercised with regard to the steps taken in connection with the recent Bill of the Swinton and Mexborough Gas Company, in which, it will be remembered, a purchase clause was inserted for the benefit of the two towns. These members alleged at the last meeting of the Council that their Clerk (Mr. F. L. Harrop) did not previously read to them as a Council a letter received from the Mexborough Authority pointing out the urgent necessity of opposing the Bill, and that, in effect, the importance and urgency of the matter was minimized by Mr. Harrop, who was acting in a dual capacity as Clerk to both the Gas Company and the Council. This was just as strongly denied by Mr. Harrop, who was supported by other members in the contention that he did read the letter in question and explained it. One member said it seemed to him that Mexborough had provided the money for the opposition, and Swinton the best witnesses. Eventually the matter was allowed to drop, and the other business of the meeting was proceeded with.

MISCELLANEOUS NEWS.

OPPOSITION TO THE GOVERNMENT COAL BILL.

An Appeal by the Institution of Gas Engineers.

The following letter, directing the attention of the members to the Coal Mines (Eight Hours) Bill, has been sent out by the Council of the Institution of Gas Engineers.

Dear Sir,—You will no doubt have seen the report in the Technical Press of the interview which a deputation of the Council recently had with the Home Secretary, with the object of expressing, on behalf of the Institution, opposition to the passing of the Coal Mines (Eight Hours) Bill. It being of the utmost importance that every effort should be made to prevent the Bill from being passed into law, the effect of which, as you are aware, would be most disastrous to the gas industry, I would ask you to be so good as to take the earliest possible steps with a view to securing the co-operation of the consumers of your undertaking in opposition to the Bill, in bringing influence to bear upon your Members of Parliament to vote against the Bill, and in employing every other means in your power to frustrate the expressed intention of its supporters to force it through Parliament.

(Signed) WALTER T. DUNN, *Secretary*.

Memorial from the Society of British Gas Industries.

The following memorial has been sent to the Home Secretary on behalf of the Council of the Society of British Gas Industries; and an acknowledgment of it has been received:—

46, *Queen Victoria Street, E.C., March* 21, 1908.

To the Right Hon. Herbert Gladstone, M.P.
Secretary of State for the Home Department.

Sir,—On behalf of the Council of the Society of British Gas Industries—a Society which is representative of the manufacturing (plant and apparatus) side of the gas industry—we, the undersigned, respectfully ask leave to represent to you that the proposed Coal Mines (Eight Hours) Bill will impose great difficulties on manufacturers generally who depend for their existence and prosperity on coal. The estimated increase in the cost of coal by the operation of this Bill will be 1s. 6d. per ton; and in manufactured iron and steel, great quantities of which are used in this industry, this would mean an increase of 6s. per ton, and an increase of from 3s. to 4s. per ton in the cost of pig iron. The limiting of the production of coal would also probably influence prices so as to make more than those differences in the cost of materials, which will give another advantage to foreign over British manufacturers. The increase in the cost of coal will interfere with the progress of the gas trade. It will increase the price of gas, which is sure to correspondingly interfere with the use of gas. From past experience, we know that when gas has risen, people have given up the use of it. To encourage the use of gas for domestic purposes is to advance a means of purifiying the atmosphere, and so of benefiting the health of the people.

It has been said that the fear of an increased price of coal is either groundless or greatly exaggerated; but we would very respectfully say that unless the Government is *certain* that the price of coal will not increase, the welfare of the country demands the withdrawal of this Bill.

We beg to remain, Sir, Your obedient Servants,

GEORGE LIVESEY, *President*.
CHAS. CLARE, *Chairman of Council*.
ARTHUR L. GRIFFITH, *Secretary*.

Opposition by Chambers of Commerce and Others.

At a Special Meeting of the Council of the Liverpool Chamber of Commerce held on Monday last week, the following resolution, which had been sent to the Government, was confirmed: "That this Chamber is of opinion that the proposed Coal Mines (Eight Hours) Bill (No. 2), if passed into law, will seriously limit the production and increase the price of coal, and is not needed in the interests of labour. The Chamber, therefore, protests against the passage of the Bill." A copy of the resolution was sent to the Members of Parliament who are honorary members of the Chamber; and Mr. W. H. Lever, M.P., replied to it. In the course of his letter, he expressed regret that the Council should have passed such a resolution. He said his own information, as the result of inquiries among colliery proprietors whom he had known all his life, was to the effect that the Bill would not limit production in any way; that it would not ultimately raise the price of coal, but might, in the initial stages, increase it to the extent of 3d. or 6d. a ton; that it was needed in the interests of labour; and that up-to-date collieries, working under modern conditions, would not be in any way affected by the Bill. He added: "The Bill is being used by unscrupulous colliery proprietors in a perfectly unscrupulous manner, and the basis on which their action rests is partly political and partly mercenary—the political bias predominating in some cases, mercenary greed predominating in others. I must say it is a source of astonishment to me that a foremost Chamber of Commerce such as Liverpool should be misled in this manner. I shall be pleased to introduce any member of your Chamber to colliery proprietors who are willing to sell the coal such collieries raise for 1909, notwithstanding the passing of the Mines (Eight Hours) Bill, at the same prices that are prevailing to-day. Colliery proprietors would be very pleased indeed to have contracts for many years in advance at to-day's prices. This seems to me a conclusive answer to the statement that prices will be further raised in consequence of the Bill." A letter has been written in answer to Mr. Lever by Mr. Cuthbert Laws, the President of the Shipping Federation, whose views on the Bill are set forth in a letter which appeared in "The Times" on Tuesday.

Correspondence has passed between the Home Secretary and the London Waterside Manufacturers' Association, with reference to a

request by the latter to be allowed to send a deputation to state the probable effect on London waterside industries if the Bill becomes law. The Home Secretary wrote on the 17th inst. that he had already received many deputations on the subject, but he was willing to receive one more combined deputation on Thursday, the 26th, and he added: "Having received deputations already from a number of important bodies of coal users, he observes that their arguments naturally proceed on the same lines—viz., to show the effect of an assumed increase in the cost of coal on their several industries; and this admits of being effectively stated in a very small compass. He would suggest, therefore, that your representative should say very shortly what you consider would be the general effect on your industry of a rise in the price of coal." In reply to this, the Secretary of the Association pointed out that Mr. Herbert Samuel, M.P., intimated, in his recent speech in the House of Commons, that it was the intention of the Government to proceed, and proceed actively, with the Bill, and further characterized statements which had been made by deputations representing the railway, shipping, gas, and other national coal-consuming interests, with regard to its probable effect, as "absurd exaggerations" and "excessive" and "fantastic" estimates. "It appears, therefore," added the Secretary, "that the circumstances fully warrant and justify this Association in sharing your doubt as to whether any useful purpose can be served by the attendance of any further deputations on the subject of the Bill. But unless His Majesty's Government is assured that the passing of the Bill will not permanently raise the price of coal, the Association contend that it should not be proceeded with, as the effect of an advance in the price of coal would be disastrous to many of our industries."

The Coal Question in the House.

Last Tuesday, Sir B. Sheffield, the Member for Brigg, asked the Home Secretary what representations he had received from Chambers of Commerce and similar bodies with regard to the Coal Bill, and how many of such Chambers had announced their support of the measure. Mr. Gladstone said he had received deputations representing the Shipping Federation, the Railway Companies' Association, the British Iron Trade Association, and other similar bodies, besides many Chambers of Commerce. Numerous written resolutions had also reached him. He had not received from these or similar bodies any representations in support of the Bill. The deputations and resolutions had been concerned with its possible economic effects in increasing the cost of production and hampering commerce and industry. In almost every case the forecasts were founded on a basis which was not that of the Bill, and were consequently erroneous. He added that he had paid, and was paying, the closest attention to the probable effect on output of any given limitation. Asked by Captain Craig if he had had his attention called to the fact that contracts for the future delivery of coal had been entered into with a proviso in them that if the Bill became law the coal would be 1s. 6d. to 2s. per ton higher in price, Mr. Gladstone replied that if the honourable and gallant gentleman would bring to his notice any such contract, he should be glad to consider it. He was aware that statements had been made that such contracts had been proposed; and he had made considerable efforts, without success, to find out whether any had been made.

Deputations to the Home Secretary.

On Tuesday, the Home Secretary received at the House of Commons a deputation from the Executive of the Miners' Federation on the subject of the Bill. Mr. Enoch Edwards, M.P., in the course of his remarks, said it had been suggested that the miners were strong enough to deal with the question themselves; but he deprecated the use of strife and strike and stoppage if it could be avoided. However, if this question were unduly delayed, there would be a strong feeling of resentment among the men; and the Miners' Federation felt that they had taken the proper and correct course in coming to Parliament to fix an eight-hours day rather than that it should be brought about by a strike. Mr. Robert Smillie and Mr. W. Abraham, M.P. (Mabon), also spoke. In reply, Mr. Gladstone said that every sane man in the country would agree that nothing could be more disastrous than anything in the shape of a great coal strike. There were two main points with which, as practical politicians, they had to deal. The first was the general question, on its merits, as to the extent of the effect on output which might be produced by the Bill; and the second was the prospects of the Bill in Parliament. Mr. Enoch Edwards had candidly admitted that the proposed limitation would affect prices. That was the kernel of the position. It was not necessary for him to argue the matter with them, but he had to argue it elsewhere. The difficulties of the question were intimate and in direct relation to the fears of the public, whether they were reasoned or unreasoned fears, with regard to the probable effects of the Bill. That was a matter which would require close attention, much energy, and much determination on the part of the Government. But they meant to press the Bill forward; and for his part he looked with confidence to the support of those present and their friends, and to the reasoned, intelligent, and generous support which had relation not only to their interests directly, but to the general interests of the whole country. He was satisfied that the men were not going to bring in this question for any merely selfish interest of their own; and he was certain they would not press their claims beyond the breaking-point, and so endanger the passing of the Bill. He thanked them for coming that day, and he felt that their presence was a great additional encouragement in the work the Government had before them in pressing the Bill forward into law. Mr. Enoch Edwards thanked Mr. Gladstone for receiving the deputation, and asked if he could tell them when the second reading would take place. Mr. Gladstone replied that it might be taken soon; but he was not then in a position to say. It all depended on the general position of the Government; and he would let them know as soon as he possibly could. It would be before Easter.

In accordance with the promise made to the Secretary of the London Waterside Manufacturers' Association, already referred to, the Home Secretary received a combined deputation from various trade organizations with reference to the Coal Mines (Eight Hours) Bill. Among other bodies represented were the Iron, Steel, and Allied Trades' Federation, the Engineering Employers' Federation, the Scottish Chamber of Manufacturing Industries, the London Electric Supply Companies, and the London Waterside Manufacturers' Association. The deputation was introduced by Mr. Harmood-Banner, M.P., who stated that the various bodies represented a consumption of coal amounting to 70 million tons per annum; the iron, steel, and allied trades alone consuming 50 million tons.

The first speaker was Sir Hugh Bell, who stated that the iron industry represented an output of 10 million tons of pig iron, and was by far the largest coal-consuming industry in the country. The present Bill must either diminish the quantity of coal raised or increase the cost, and it might possibly do both. The common estimate was that the increase would not be less than 10 per cent. If their fears were realized, as many as 30,000 or 40,000 men would be thrown out of employment in the iron and steel trades, and, with their families, the people concerned would number 150,000 or 200,000. Sir Hugh Bell was followed by Mr. E. Parkes, M.P., speaking on behalf of the Midland iron and steel trades. He pointed out that there was to be uniformity in the working of the collieries in the country, which was not possible in some places. In the Staffordshire district, double shifts would be impossible. Mr. Gladstone remarked that what was generally understood by an Eight-Hours Bill until recently was a bank-to-bank eight hours, which meant eight hours between the first man down and the last man up. But the Bill of the Government was not on this basis at all, and there had been general misapprehension on the point. It excluded what was known as one winding-time, and gave half-an-hour more underground per day. It meant an average eight hours down the pit, the margin being 7½ to 8½ hours. The middle-man would be down the pit for eight hours. Mr. Parkes went on to say that the extra cost of coal would be 1s. to 1s. 6d. per ton; but that if it were only 1s. a ton, iron and steel manufactures would be advanced by 4s. or 5s. a ton. There would be an increase in all foreign competition, and at present they were competing with foreign countries under altogether unfair conditions. Sir Andrew Noble, speaking for the Engineering Employers' Federation and the shipbuilding employers, remarked that foreign competition was already felt, and if any further handicap were placed on home industries it would be to the benefit of the foreigner.

Other members of the deputation having spoken, Mr. Gladstone, in reply, said he agreed, and had always done so, that on a given basis a rise in the price of coal must be very grave and widespread. He was not there to argue this point with them. His concern was as to what would be the effect of the Bill on output. If it was to diminish it, to what extent would this be done? and would the price of coal be raised, and to what extent? There was a great deal of loose talk about an Eight-Hours Bill. They (the deputation) might unload their minds, at any rate, of a certain percentage of anxiety, because what was in their minds as the basis of the Bill was not in fact its basis; and therefore they must discount their estimates proportionately. The Bill as it stood provided an additional half-hour per day per man over and above the time which would be allowed to the men by what was called a rigid bank-to-bank Bill. It had been suggested to him that prices of coal had gone up suddenly in certain cases and so created crises. He agreed that if they had a legislative limitation of hours a crisis might be still more serious; but then he would point to the provision in the Bill which gave the Government of the day power, by Order in Council, to suspend the operation of the Act if such a serious condition was to come about. Therefore they had not in the least put their heads in the sack and pretended there could be no danger in the Bill. He made no pretence of stating the whole case for the Bill, because this would be put before Parliament; but there was one point he would like to urge. Several speakers had said, and quite rightly, that these matters were best settled between employers and employed. That was a beautiful ideal which no Government had found, or ever would find, possible in all circumstances. It was only a question of degree as to how far the Government should come in. They might say, "Why, if the miners are so keen for a settlement, have they not got it by exercising their own powers?" The answer was that they had found it difficult to effect a settlement by such means of persuasion as they themselves possessed. It was therefore a matter for consideration whether, by means of legislation, the Government could come in between the parties and settle the question on a fair and reasonable basis, and bring about what would practically be an agreement between employers and employed. From the time he was first concerned with the question, in 1906, it had been his chief hope to bring about a solution satisfactory to all parties. Now he held the hope more strongly than ever; and he had done everything he could to see that the economic side of the question should be looked into by the best experts available. He had not denied that the Bill as it stood might lead to a certain limitation of output if trade was good and the demand was good at the outset. He was prepared to argue that there was a great margin on which the coalowners could draw to make up for the limitations imposed. The Government would never have introduced the Bill if they had thought the effects of it would be to bring about a permanent and material increase in the cost of coal. He was not prepared to go farther than to say this. He had not said that the Bill as it stood was the one which the Government meant and intended to pass into law. It was open to amendment. He did not accept the view that its effect would be anything like what had been stated. These exaggerations had been due to a misunderstanding with regard to what was in the Bill. So far as it might be calculated to limit the output and increase prices, they were giving, and would continue to give, most anxious consideration to the question; and the deputation might rest assured that the Government were not going to pass into law a measure which, after the fullest research, they thought would do any harm, permanent or otherwise, to the great industries of the country.

In thanking Mr. Gladstone on behalf of the deputation, Sir Hugh Bell remarked that, after what he (the Home Secretary) had said, their fears were rather increased than lessened.

Failure of the Electric Light in Sydenham and Forest Hill.—There was a failure of the electric light in Sydenham and Forest Hill last Friday evening. True, it was not of long duration; but sufficiently so to cause an amount of inconvenience and irritation.

PUBLIC LIGHTING OF LIVERPOOL.

Annual Report of the Superintendent.

The report for the twelve months ending Dec. 31 of Mr. A. G. Smith, the Superintendent of Street Lighting, Gas Examiner, and Official Inspector of Meters to the Corporation of Liverpool, contains the following particulars with regard to the gas supply.

The city is at present lighted by 18,955 lamps, 13,103 of them being in the old city and 5852 in the suburbs. They are distributed over 454¾ miles. The following table shows the number of lamps used in the lighting of streets, courts, and passages :—

District.	Streets.			Courts.	Passages.	
	Flat Flame.	Incandescent.	Electric.	Flat Flame.	Flat Flame.	Incandescent.
Old City	242	9,291	210	791	2,341	23
Suburbs	34	4,818	12	—	971	1
Total . . .	276	14,109	222	791	3,312	24

The following figures compare the present lighting (*b*) with that of 1926 (*a*) :—

Mileage of Streets Lighted.	Price of Gas per 1000 Cubic Feet	Total No. of Lamps.	Total Illuminating Power. Candles.		Total Maintenance Charges.
			Before Midnight.	After Midnight.	
(*a*) 451¼	2s. 3d.	18,783	1,111,932	635,260	£46,630
(*b*) 454⅞	2s. 3d.	18,955	1,127,596	643,188	£47,780

During the past year the lighting of 3⅝ miles of new streets was carried out by the erection of two incandescent electric and 90 single incandescent gas-lamps. The lighting of 2⅝ miles of roads was also re-arranged, involving the erection of 38 double and 35 single incandescent gas-lamps, and the removal of 53 existing lamps to new positions; while 73 lamps were removed to new positions owing to the widening of roadways and sidewalks, alterations to property, and other causes. Thirteen columns were fixed in lieu of brackets, and 25 new columns in lieu of broken ones. On July 11, a report was presented to the Committee recommending the adoption of the Gunning system of automatically lighting and extinguishing the street-lamps, which it was estimated would result in considerable saving. The Committee, however, decided to experiment further, and ordered the purchase of 1000 controllers; but this number was subsequently reduced to 250 by the Council. These have now been supplied and fixed; and the result of the experiment will be reported to the Committee at a later date. The total length of roads lighted at the end of the year (irrespective of passages and courts) amounted to 454⅞ miles; 5⅛ miles being by electricity, 440 miles by incandescent gas, and the remaining 9¾ miles, principally back-streets, by the ordinary flat-flame system.

The work of lamp-lighting is carried out by 14 foremen and 182 lighters; the average number of lamps dealt with by each lighter being 111 in the old city and 93 in the suburbs. From May 15 to July 31 in the old city, and May 1 to Aug. 15 in the suburbs, the lamps are lighted at the lower rate only—the midnight visits for reduction not being made. In lieu of this, each lighter is employed for five days on lamp painting; and by this means one-third of the lamps and columns in the city are annually overhauled and painted. The entire maintenance of the columns, brackets, lamps, and fittings is undertaken by the department; and the following work was carried out by a staff of 72 mechanics, &c. (the figures for 1906 being also given for the sake of comparison) :—

	1906.	1907.
On district—		
Columns fixed	140 ..	220
,, reinstated	118 ..	145
Lamps repaired	5,631 ..	6,834
,, reglazed	18,684 ..	22,661
,, changed	1,115 ..	2,895
Visits paid by trimmers to incandescent gas-lamps	284,482 ..	236,604
In workshop—		
Lamps repaired	3,391 ..	4,007
,, reglazed	2,912 ..	3,542
,, manufactured	25 ..	290
In stores—		
Incandescent gas-burners cleaned, repaired and adjusted, &c.	4,788 ..	4,588
New incandescent gas-burners adjusted	2,134 ..	1,853
Do. chimneys cleaned. . . .	238,688 ..	202,766
Regulators cleaned, adjusted, &c. . . .	15,687 ..	12,120
New regulators adjusted only	5,875 ..	1,651

During the year there were 342 accidents to street-lamps caused by collision with vehicles. In 140 cases the police were able to ascertain the names and addresses of the owners of the vehicles, and accounts to the value of £119 12s. 4d. were rendered.

Gas-Meter Testing.

With regard to gas-meter testing, the Inspector reports that during the year this department was again practically self-supporting. The expenditure amounted to £444 1s. 9d., while the fees reached a total of £443 19s. 3d., as against £446 7s. 9d. in the previous year, which, however, was a record one. The following are the details of the year's work :—

	Gas Company's.	Sundry.	Prepayment.
Meters certified	9002 ..	538 ..	848
,, rejected	68 ..	340 ..	81
	9070 ..	878 ..	929

The grand total is 10,877, compared with 10,951 in 1906.

During the year an effort was made to induce the Board of Trade to revise the regulations which have been in operation since 1859; and the following recommendations were sent by the department to the Board of Trade for consideration. Similar recommendations were sent from the various testing stations throughout the country; but nothing definite has yet been decided upon.

1.—That the index of each meter be made detachable and subjected to a separate test. (In this connection, it may be stated that the Liverpool testing-station has been the pioneer of this work; the indexes of the Gas Company's wet meters having, by arrangement with the Company, always been tested at a separate charge of 3d. But there is no statutory power under which the testing of the indexes could be made compulsory.)

2.—That meter-indexes should be standardized as regards the gearing of the wheels—*i.e.*, number and pitch of teeth and pinions.

3.—Section 13 of the Act provides that in testing a meter for percentage of error, it shall be tested "at a pressure equal to a column of water 5-10ths of an inch high." This clause requires altering to the pressure at which the meter works on the district.

4.—It should be made compulsory that all gas-meters should be retested every seven years.

5.—Provision should be made for testing all prepayment attachments of gas-meters.

6.—The present various methods of stamping meters should be altered by provision being made for a uniform system of stamping meters to prevent fraud.

7.—The present scale of fees should be revised. Instead of the charge for testing being according to the registering capacity of the meter, it should be fixed according to the nominal size of the meter, and in addition a charge should be fixed for the testing of a meter-index.

8.—No meter fixed or refixed after the passing of an Act embodying the above recommendations to be considered a legal measure unless it has been tested and sealed according to the provisions of the Act by an independent authority.

The total number of electrical meters tested during the year was 3100. Of these, 1947 were approved, and 1153 rejected. The improvement in the new meters received was continued; only 11 per cent. being rejected, against 14 per cent. in 1906, and 17 per cent. in 1905.

Quality of the Gas.

The work of testing the gas supplied to the city by the Liverpool United Gaslight Company for illuminating and calorific power, purity, and pressure was carried out continuously throughout the year. The illuminating power is fixed by statute at 20 candles, when measured with a batswing burner consuming 5 cubic feet of gas per hour; the burner in use being known as the No. 7 steatite batswing, approved by the Metropolitan Gas Referees. The gas is tested daily at the office; and, by arrangement with the Gas Company, the Gas Examiner is empowered to test the gas, by means of a portable (Dibdin) photometer, in any part of the city without notice. Under this arrangement, the apparatus is conveyed by cab to any one of the numerous establishments of the Corporation scattered all over the city, and the gas duly examined. The results of the tests are as follows: Average illuminating value at office, 20·70 candles; in district, 20·73 candles. The gas is tested daily in the office for its calorific value, by means of a Simmance-Abady calorimeter. There were 263 tests made, showing an average of 658·91 B.Th.U. per foot of gas net, against 694·92 net in the previous year. This, Mr. Smith remarks, may be considered satisfactory.

For carbon monoxide tests, 417 samples of gas were obtained during the year from various parts of the city; the average of the tests being 12·1 per cent.—indicating an admixture of 25·4 per cent. of carburetted water gas, which, he says, is in conformity with the Departmental Committee's recommendations on the subject. But, he adds, it is to be regretted that as much as 18·6 per cent. of carbon monoxide, representing an admixture of 52·5 per cent. of carburetted water gas, has been found at Garston; the average of the tests in this portion of the city being 17·3 per cent., representing an admixture of 47 per cent. of carburetted water gas.

Under the Gas Company's Act, 1882, remarks the Superintendent, limitation is placed on the amount of the sulphur compounds in the gas; and testing-stations for the use of the gas examiner are provided at the various gas-works. At Linacre during the summer months the sulphur compounds present in the gas contained an average excess of 3·36 grains per 100 cubic feet. The attention of the Engineer of the Company was called to this matter on several occasions; and he stated in reply that the excess was due to an experiment with new coal, and that he was doing all he could to keep within the limitations.

Some Other Points.

Following the refusal of the Local Government Board to receive a deputation of the Health and Lighting Committees on the subject of carburetted water gas, the Committee considered what further steps could be taken to safeguard the public against the danger of escaping gas containing a high percentage of carbon monoxide; and it was ultimately decided, provided the Committee had statutory powers, to undertake, at a nominal charge of 2s. 6d., the testing of consumers' pipes and fittings for soundness. The Town Clerk having reported that the establishment of such a department could not be challenged, seeing that it would be self-supporting, the work was proceeded with; and during the year 339 tests were made. In 36 cases the fittings were found to be sound; while in the remaining 303, escapes were found varying from $\frac{1}{10}$th to 80 cubic feet per hour. The testing fees were £42 7s. 6d.

During the year the department received 4957 reports of failures of the gas supply to public lamps, due to the presence of naphthalene, as against 9514 the previous year. Nearly the whole of these stoppages were in the lamp-fittings, and were therefore dealt with by the department's own fitters. The remainder, being in the service-pipes, were dealt with by the Company.

The total charges in connection with the public lighting of the city

and supervision of the gas supply for the year amounted to £51,125; and a revenue of £3006 was derived from work charged to other departments and bodies, which includes a large portion of the gas-fitting work of the Corporation—making a net expenditure of £48,119, as against £47,085 in 1906.

HUDDERSFIELD AND THE LONGWOOD GAS-WORKS.

The Charge to Consumers.

At the last Monthly Meeting of the Huddersfield Borough Council, Mr. Riley drew attention to a minute to the effect that it be referred to the Parliamentary Committee to consider the question of the purchase of the Longwood Gas-Works, or the adjustment of charges to consumers. He asked what the minute actually meant; stating that he was informed that ratepayers in the Longwood Ward had to pay a higher price for gas than in other parts of the borough. Mr. Eastwood said he understood that when Longwood people were induced to join the borough some prominent members of the Council promised they should have gas at the same price as that at which it was supplied in other parts of the borough. One had to take the promises of private individuals for what they were worth on those occasions; but a good many Longwood people were much impressed with what was said at that time. There was a grievance, inasmuch as Longwood people had to pay considerably more than ratepayers who were supplied with Corporation gas. This was not the first time the charges had been before the Council; and no doubt if there had not been great difficulties in the way when Longwood was amalgamated with the borough, the Council would have purchased the Longwood Gas-Works.

The Chairman of the Gas Committee (Alderman Jessop) remarked that this was an old question. Mr. Eastwood had referred to the fact that when Longwood became part of the borough an effort was made to have the price of gas the same as that in Huddersfield. He assured Mr. Eastwood that special efforts with this end in view had been made on many occasions; and, in fact, at one period the Huddersfield Gas Committee were prepared to buy the Longwood Gas-Works, for the very reason that they were anxious to keep faith with the ratepayers of Longwood, and would have done so if a price could have been agreed upon. The resolution meant that the Parliamentary Committee were to consider the desirability of negotiating with the Company for the sale of the works, or going to Parliament for powers to acquire the works compulsorily if the Directors were unwilling to let the Longwood ratepayers have gas at the same price as that at which it was supplied by the Corporation.

The minutes were confirmed.

RESERVE AND DEPRECIATION AT LEEDS.

At a Special Meeting of the Leeds City Council held recently, Alderman Wilson moved a resolution rescinding previous resolutions of the Council with regard to reserve funds and depreciation in the matter of the water-works, gas-works, tramways, and electricity undertakings, and proposing that for each of these departments reserve funds of a maximum of £25,000 be formed. The proposal for this year was to pay in £5000 to the water-works reserve fund, £3000 to the gas-works, £4000 to the tramways, and £3000 to the electricity department—a total of £15,000. He said that in view of the fact that the municipal undertakings were regularly and heavily renewed year by year, it was clear they had only two other contingencies to provide for—any loss that might be incurred on the year's working and serious accidents. The water-works, he admitted, were the most difficult to deal with; and to this end he proposed that the largest sum should be set aside for that department this year. In the Electricity Department they had "scrapped" a great deal of old plant; and no doubt the Chairman of that department would argue that there was still more to be dealt with in the same way. But there was no reason why that should not be done against current revenue charges. The proposal to fix up a reserve fund for each of these undertakings with a maximum of £25,000 was, in his opinion, quite adequate; but it did not limit the Council. If they thought fit, they could increase this maximum at any time.

The motion having been seconded, the Chairman of the Water Committee (Mr. F. Ogden) argued that there was a difference between his Committee and any other trading concern of the Corporation, inasmuch as in the case of the other trading concerns of the Corporation any surpluses they had were really surpluses which had been earned in any particular year. But the Water Committee were in a very different position. As a matter of fact, for years the Committee had been borrowing money in order to pay interest upon borrowed money. In his opinion, this was an unsound and an unsafe proceeding. He quite admitted that the powers conferred upon the Committee allowed this to be done; but no similar powers were now being conferred. And it was clearly the opinion of the authorities that it was not a sound or a business-like proceeding to be capitalizing interest in addition to the amounts necessary to carry out the works which were being constructed. He was not sure whether the Council knew the extent to which this business had grown. By the end of this year, the Water Committee would have borrowed £85,000 and added it to capital for the purpose of paying interest on borrowed money. In 1911, their power to capitalize borrowed money to pay interest on borrowed money would cease; and when that time came, the whole of the interest upon the entire capital expenditure, and the whole of the sinking fund in addition, would fall upon the Council. At that time, after extinguishing all the profits and after extinguishing every penny of the reserve fund which was proposed this year, there would then fall upon the rates of the city an amount equal to nearly £44,000 per year. This, he submitted, was a very unsound position in which it was proposed to place the Water Committee. In 1911, also, there would be over £162,000 of capitalized interest. In interest and sinking fund upon this capitalized interest alone was represented a charge of nearly £8500 a year. The unsoundness of the position was that they were reckoning they were making profits upon water year by year when really they were borrowing more money to pay interest than the whole of their so-called profit amounted to. What did it mean to capitalize this £162,000 which would fall upon the rates in 1911? It meant that by the process they were now about to employ, it would take over £800,000 to extinguish this £162,000. They ought to pause before regarding as a profit mere casual surpluses which existed from year to year, when they were adding these sums of money to the capital debt of the department. If they were to say that no profit should be considered as profit until the whole of this interest they were now capitalizing had been provided for, he would agree to the proposal at once. As to the proposed maximum of £25,000 for a reserve fund for the water-works, it was quite inadequate. If a disaster occurred at all, £25,000 would be a mere drop in the ocean. There would be no reserve in £25,000 at all adequate to meet the consequences of a disaster in such an undertaking. With regard to the question of a deficiency in any year's trading, he had shown that in 1911 there would fall a sum of £43,000 upon the rating account of that year. It was true they might provide for a considerable portion of this sum by increasing the rates charged for water in the city; but any deficiency upon the Water Committee account was likely to be so large that a maximum of £25,000 was miserably inadequate. The worst part of the whole proceeding was that, small as was the provision of £25,000, there was no certainty about the sum being actually provided. They were to put only £5000 into the fund this year; and when he asked the Chairman of the Finance Committee to embody in the resolution that these sums should be annually paid into the fund until £25,000 was reached, he refused to be bound.

In moving that the matter be referred back, Mr. Macrae said Alderman Wilson was really attempting to reduce the rates by what he hoped to be able to take of the surpluses. No party ought to pursue a policy of running the trading departments so as to make large surpluses each year for the relief of the rates. The amendment was, however, defeated, and the resolution approved.

GAS SUPPLY AT WHITBY.

At the Annual Meeting of the Whitby Gas Company on the 21st inst., the accounts presented showed that the revenue from the sale of gas for public and private lighting in the past year amounted to £6678, and that the total receipts were £8825. The expenditure being £6104, there was a balance of £2721 to go to the profit and loss account. The amount available for distribution was £1520, and the Directors recommended the payment of dividends at the rate of £3 per cent. on the original capital and £2 2s. per cent. on the additional capital (both less income-tax) for the half year ended Dec. 31; making with the interim dividends paid for the half year ended June 30 last £6 and £4 4s. per cent. respectively for the year. In moving the adoption of the report, the Chairman (Mr. Freeman Richardson) referred to the uncertain condition of the coal market in consequence of the introduction by the Government of the Mines (Eight Hours) Bill, and to the strenuous opposition that is being shown to the measure, said notwithstanding that the Company had paid about £150 more for coal and £112 more for rates and taxes, the revenue account was only £27 less than in 1906, due to savings being effected in other directions, and also (which was most gratifying) to an increase in the receipts. The gas sold to private consumers last year was about 400,000 cubic feet more than in the preceding twelve months; the receipts under this head being £6654, against £6635. Residuals realized £1553, compared with £1539; and the total receipts were £8825, against £8751. Having regard to the facts already mentioned, and to the great increase which had taken place during recent years in the Company's stock of gas-stoves, prepayment meters, and other fittings, the Directors deemed it advisable not to divide the whole amount shown in the account as profit, but to carry forward a substantial sum to provide for contingencies, and with a view to create a reserve fund which would meet the loss resulting from depreciation, and maintain the value of the Company's assets intact. The balance of profit carried forward was £1520, compared with £943 brought from 1906. The report was adopted, and dividends at the rates recommended were declared. The retiring Director (Mr. Alexander Allan, of Scarborough) having been re-elected, votes of thanks were accorded to the Chairman and Directors, as well as to the officers and staff, for their services during last year.

Liege in Darkness.—We learn from a local paper that, in consequence of the bursting of a 12-inch steam-pipe in the dynamo-room at the central electricity station at Liége, the town was in darkness from seven till eleven o'clock on Monday last week. Two workmen who were in the room at the time had a marvellous escape; and owing to their coolness and presence of mind what might have been an alarming accident was averted. As it was, considerable inconvenience was experienced. Owing to the stoppage of the current, first the tramcars were brought to a standstill, and then the lighting, which was maintained for a time by the accumulators, failed; only the few remaining gas-lamps being available to guide pedestrians. The proprietors of the large cafés had to revert to whatever light-giving material they could find much to the amusement of the frequenters. At the two theatres, which are lighted exclusively by electricity, things were rather more serious. Both were crowded, and it was only by the tact of the managers that there was no panic. The audience made their way out of the buildings by the aid of lamps, and with the assurance that their money would be returned during the week. Meanwhile, prompt measures were taken to repair the broken pipe; and by half-past ten o'clock the consumers had an intermittent supply of current. Street lighting was partially resumed by eleven; and by midnight the tramcars were once more on the move—towards their shed. The town is served by a Company who have been in existence for fifteen years; and it is stated that this is their first mishap. They were hoping to go on till July 16, when their concession terminates, without having any trouble. But the affair of yesterday week has shattered their hopes.

BRITISH GASLIGHT COMPANY, LIMITED.

Increasing Business—Necessity for New Capital—Late Secretary.

The Half-Yearly General Meeting of this Company was held last Wednesday, at the London Offices, No. 11, George Yard, Lombard Street, E.C.—Mr. J. HORSLEY PALMER in the chair.

The SECRETARY (Mr. A. W. Brookes) read the notice convening the meeting; also the report of the Directors, and (in accordance with statutory requirement) the accounts of the Norwich station. The report was as follows:—

The Directors submit the half-yearly accounts of the Company to Dec. 31 last, as examined and certified by the Auditors, who have also vouched for the correctness of the several investments held by the Company.

The available profit is £25,467 after deducting [omitting shillings and pence] the following sums: Income-tax, £1697; Hull debenture interest, £2137; Norwich debenture interest, £1130; Potteries debenture interest, £665; Trowbridge debenture interest, £166; interest on debenture stock, £2280—total, £8076.

HULL.—The gas-rental shows an increase of £2202, as compared with that of the corresponding period of 1906; the price of gas having been the same—viz., 2s. per 1000 cubic feet. Coke shows an increase of £3087; tar and tar distilling, £185; ammoniacal liquor and sulphate of ammonia, £386. Coals have cost 13s. 11d. per ton, as against 12s. Coke has realized 11s. 5d. per ton, as against 10s. The gas sent out was 672,172,000 cubic feet, against 643,286,000 cubic feet in the corresponding period of 1906—an increase of 28,886,000 cubic feet, equal to 4·49 per cent. Of this quantity, 46,142,000 cubic feet was supplied in bulk to the Corporation for the supply of the Old Town. The profit realized is £2212 in excess of the parliamentary interest. This sum has been invested, making the reserve fund £32,817.

NORWICH.—The gas-rental shows an increase of £1362, as compared with that of the corresponding period of 1906; the price of gas having been the same—viz., 3s. 3d. per 1000 cubic feet. Coke shows an increase of £899; tar and ammoniacal liquor, a decrease of £397. Coals have cost 17s. 9d. per ton, against 15s. 10d. Coke has realized 15s. 7d. per ton, against 14s. 3d. The gas sent out was 271,154,000 cubic feet, as against 262,704,000 cubic feet—an increase of 8,450,000 cubic feet, or equal to 3·21 per cent. The profit realized, after writing off £4000 on account of reconstruction of works, is £4317 less than the parliamentary interest.

POTTERIES.—The gas-rental shows an increase of £403 as compared with that of the corresponding period of 1906; the price of gas having been the same—viz., 2s. 6d. per 1000 cubic feet. Coke shows an increase of £221; tar an increase of £107; ammoniacal liquor and sulphate of ammonia, a decrease of £56. Coals have cost 10s. 10d. per ton, against 10s. 3d. Coke has realized 8s. 2d. per ton, against 7s. 6d. The gas sent out was 211,113,000 cubic feet, as against 203,274,000 cubic feet—an increase of 7,839,000 cubic feet, or equal to 3·85 per cent. The profit realized, after writing off £2500 on account of buildings and plant thrown out of use, is £1784 less than the parliamentary interest. This sum has been taken from the reserve fund, leaving a balance of £5317 to the credit of that account.

TROWBRIDGE.—The gas-rental shows an increase of £323 as compared with that of the corresponding period of 1906; the price of gas having been the same—viz., 3s. per 1000 cubic feet, with discounts. Residual products show an increase of £457. Coals have cost 16s. 10d. per ton, against 15s. 1d. Coke realized 12s. 7d. per ton, against 9s. The gas sent out was 41,051,200 cubic feet, against 38,099,800 cubic feet—an increase of 2,951,400 cubic feet, or equal to 7·74 per cent. The profit realized is £183 in excess of the parliamentary interest.

HOLYWELL.—The gas-rental shows an increase of £86; and residual products of £5. The profit realized is £564.

PROFIT AND DIVIDEND.—The available profit, added to the previous balance of profit and loss, amounts to £70,736. From this sum the Directors recommend a dividend at the rate of 10 per cent. per annum, free of income-tax. This will amount to £24,500, and leave a balance of £46,236.

The CHAIRMAN, in moving the adoption of the report and accounts, said he had a very plain and uninteresting statement to make to the proprietors with regard to the proceedings of the half year, because, though the Company had steadily and slowly progressed in their work at the different stations, it had been a dull and uneventful half year, and there were no important matters to report relating to the general working. As he said, they could show a certain amount of progress, though small. He had noticed, from the reports of nearly every big gas company throughout England, that they had also had to report to their shareholders that the increase of business in the half year had been somewhat low. However, it might be regarded as a satisfactory condition to be able to report that at Hull they had an increase of 4½ per cent., which was on a considerable increase on 1906. In that year it was 7 per cent.; and in the half year ending June 30 last, it was 6⅛ per cent. The same remark would apply exactly to Norwich, where they had an increase of 3¼ per cent., which was upon large increases in the two half years ending June last. At the Potteries, the increase was still more gratifying, because, though it was only 3·85 per cent., the Directors had to report to the shareholders at this time last year that the increase was almost at a standstill. At the smaller station of Trowbridge, where they had a considerable set-back a year ago, owing to the badness of the cloth trade, they had, he was glad to say, an increase of 7¾ per cent. So much for the increases in the sales of gas. He was sorry to say the profits at the stations had not shown a corresponding increase. This was principally owing to the advanced cost of coal and oil; and this had been made the more apparent to the shareholders by the accounts that had been read from the Norwich station. There the principal falling off in profit had taken place. For coal and oil at that station, they had had to pay over £3000 more; and they had had exceptionally heavy expenses for wear and tear, and repairing and renewing gas-stoves, &c. This, however, would not occur to so large an extent during the coming half year. The report of the Directors had given a few statistics with regard to the progress of the business at the different stations; but it might be interesting to state the increases in the slot-meters and in the stoves. At Hull, they had an increase during the half year of 1138 slot meters; and the total number fixed was now very nearly 17,500. The figures he was now giving as to additions all represented new customers. As to cooking-stoves, they had fixed at Hull an extra 321; and they had now nearly 10,000 connected up in the town. The increase in the number of cottages supplied with fittings was 970; and the total number was now close upon 14,000. He had to announce an increase at Norwich of 546 slot meters and 400 stoves. It was a remarkable thing that at Norwich they had taken up the question of heating and cooking by gas to a much greater extent than Hull had done. As a matter of fact, he found that the number of stoves fixed at Norwich was no less than 18,500, as against 9200 at Hull. At Norwich, they had also fitted up 544 more houses, making the total 15,700. All this was satisfactory so far as it went; but it brought him to the subject of the capital expenditure of the Company, because it would be recognized that, when the Company went on increasing at the rate he had indicated, it was absolutely necessary—it was so with every progressive gas company—that capital should be expended as called for, and therefore capital had to be raised. The Company were now coming to the point at which they would have spent all that the shareholders authorized the Directors to raise some few years ago; and the question would shortly be before the Board as to the form in which the increased capital expenditure should be met. They had at the moment unexercised powers at Norwich to raise a certain amount of 4 per cent. debentures. The amount was £35,000; and it was the intention of the Directors to try and issue this in Norwich and the neighbourhood, so that their customers and the general public in the city and district might have an opportunity of sharing in the prosperity of the Company, and become interested in its success. If the Norwich people did not think it worth while to take up what was offered to them, he had perfect confidence that their own shareholders would come forward and take up any balance not issued in Norwich. Later on, probably the Directors would have to issue a further amount of shares as they did about three years ago; but that was not formally before the meeting that day. Before he sat down, he had to refer to the great loss sustained by the Company during the last half year. He need hardly say he alluded to the death of their late Secretary (Mr. H. B. Chamberlain). He was a gentleman who had devoted the whole of his working life to the interests of the Company. He entered their service as junior clerk in June, 1861, at the age of 18; and he worked his way steadily up through the various offices, until he was appointed Secretary ten years ago. He had therefore completed nearly 46½ years' service when his death occurred. The vacant position had been filled by the Directors appointing Mr. Brookes, who had also been in the Company's service for a long time. He was also a gentleman in whom they had perfect confidence, and who he (the Chairman) was perfectly certain possessed all the ability and natural zeal for carrying on the work of the Company in the best interests of the shareholders, and he would add in the best interests of the Directors as well.

Mr. FREDERICK WILKIN seconded the motion, which was unanimously carried.

On the proposition of the CHAIRMAN, seconded by Major-General W. T. CORRIE, the dividend recommended in the report was unanimously agreed to.

Mr. BERNARD F. HARRIS, in proposing a vote of thanks to the Chairman and Directors, said he was sure the half year, in view of the dearness of coal (about which the Chairman had not said much), must have been an anxious one for the Board. But notwithstanding the price of coal, they had come out with something to the good, which showed the great interest the Directors had taken in looking after the affairs of the Company.

Mr. KENNETH R. MACKAY seconded the motion, which was cordially endorsed by the shareholders.

The CHAIRMAN, in the course of his acknowledgment, said he could have spoken at great length on the price of coal, the Coal Mines (Eight Hours) Bill, and so on; but he thought it well, at a practical business meeting of this sort, to avoid politics. They, of course, all hoped the price of coal would be diminished during the year; it would considerably benefit all gas companies. Proceeding, he proposed a vote of thanks to the Secretary and the officers of the Company generally. He remarked that he need not dilate on the merits of the Secretary. He (the Chairman) had told the shareholders of the confidence the Directors reposed in Mr. Brookes, and he might say the same in respect of all the officers at the different stations. The Company were admirably served—in fact, no Company could be served better by their engineers, officers, and staffs.

Mr. CORBET WOODALL seconded the motion, which was heartily passed.

The SECRETARY, in responding, said he should like, by reason of his long business association with the late Secretary, to acknowledge the very kind references that had been made to Mr. Chamberlain, which would be appreciated by his relatives as well as by his numerous friends. He (Mr. Brookes) also wished to express his own thanks for the encouraging words that had been used in respect to himself. On behalf of the officers generally, he was sure they all had the interests of the Company at heart; and it was very gratifying to them to receive this recognition of their efforts.

OTTOMAN GAS COMPANY, LIMITED.

More Gas from Less Coal.

The Ordinary General Meeting of this Company was held last Tuesday, at the London Offices, No. 9, Queen Street Place, E.C.—Mr. STEPHENSON R. CLARKE in the chair.

The SECRETARY (Mr. Thomas Guyatt) read the notice convening the meeting, together with the Auditors' certificate and the minutes of the previous meeting; and the Directors' report and the statement of accounts (which were noticed in last week's issue of the "JOURNAL," p. 788) were taken as read.

The CHAIRMAN remarked that he had again to present the half-year's report to the proprietors, as he was sorry to say their worthy Chairman (Colonel James Le Geyt Daniell) had had to obey the orders of his doctor and take a change of climate. He was sure they would all regret his absence, and none more than he himself. In a letter just received, Colonel Daniell desired him to express his regret to all his friends at not being able to be present. There was not much to relate in connection with the working for the half year to the 31st of

December last. There was a small increase in the revenue from gas, products, and fittings respectively. The Board had hoped at one time that it would have been larger; but owing to trade depression in Smyrna, and likewise in some degree to competition from new forms of petroleum lamps, the rate of increase of the first months of the half year was not maintained. They had, however, been able to effect a considerable saving under the head of coals; and this he thought was especially interesting as during the past year it had not been usual. The Company's new retort-house had worked well; and they had had a larger production of gas from a smaller tonnage of coals carbonized. In the corresponding period of 1906, the 6621 tons carbonized produced 69,072,000 cubic feet of gas; while during the last half of 1907, 6575 tons yielded 70,099,000 cubic feet of gas. The cost per ton, too, had been reduced; and this was owing to their having been able to use a larger proportion of Turkish coals. Though these coals were not quite equal to Durham gas coals in yield, they had done very well, and were much cheaper. The amortization fund was fully invested; and for the first time in the history of the Company, a portion of the reserve fund—namely, £1000—had also been invested. He concluded by moving the adoption of the report and accounts.

Mr. H. W. ANDREWS seconded the motion; and it was carried unanimously.

On the proposition of the CHAIRMAN, seconded by Mr. A. M. PADDON, dividends were declared for the half year ended Dec. 31 at the rate of 7 per cent. per annum, less income-tax, on the preference shares, and at the rate of 7 per cent. free of income-tax on the ordinary shares.

On the motion of Mr. ANDREWS, seconded by Mr. PADDON, the retiring Directors (Messrs. Stephenson R. Clarke and Strachan C. Clarke) were re-elected; and on the proposition of Mr. F. C. COLLINGWOOD, seconded by Mr. W. T. CLARKE, the Auditors (Messrs. T. H. Cooke and A. W. Cooper) were also re-appointed.

Mr. A. W. OKE proposed a vote of thanks to the Chairman and Directors for their services. It was interesting to them, he said, to hear that the Board had been able to effect such economy in the matter of coal. When many English gas companies were suffering so severely from the high price of coal, it was quite refreshing to learn that their own Company could avail themselves of a supply which would compete practically with Durham coal.

Mr. W. H. DAUN seconded the motion; and it was heartily agreed to.

The CHAIRMAN, in returning thanks, remarked that there had been no special troubles to contend with during the past six months; and he hoped that this would long continue to be the case with the affairs of the Company. He then proposed a vote of thanks to the Engineer (Mr. John Gandon) and staff in Smyrna, and to their Secretary, Mr. Guyatt. The Directors, he said, found that any trouble which might occur was removed at once by the energetic and careful attention given by the staff, of whose services he could not speak too highly.

Mr. PADDON seconded the proposition, and said he was sure the proprietors would include with the officers specifically mentioned Mr. A. F. Phillips, the Consulting Engineer, to whom the Company owed a considerable debt for his able guidance. He did not know one company where the procedure was less stereotyped than it was in the case of the Ottoman Gas Company. There was always some fresh difficulty, always some fresh problem, which the proceedings of other companies did not afford any precedent for dealing with. This was a feature which certainly added to the indebtedness of the proprietors to the officers who so ably and effectively discharged their duties.

The vote having been unanimously accorded,

Mr. GUYATT briefly returned thanks on behalf of Mr. Gandon and himself, and the respective staffs.

GAS SUPPLY IN SHANGHAI.

We have received the report and accounts of the Shanghai Gas Company, Limited, for the past year, which were presented at the annual general meeting on the 11th inst. We learn from it that the progress of the Company continues satisfactory. The revenue amounted to 643,571 taels, and the expenditure to 402,004 taels; the profit on the working account amounting to 241,567 taels, which was transferred to the profit and loss account. The net profit for the year was 248,951 taels. The balance at the credit of the profit and loss account, after crediting the account with 7991 taels carried forward, and deducting the interim dividend, at the rate of 7 per cent., paid in July, was 173,102 taels, which the Directors recommended should be appropriated as follows: Final dividend of 8 per cent. (making 15 per cent. for the year), 96,000 taels; amount written off for depreciation of land and buildings, plant, and furniture, 70,499 taels; carried forward, 6603 taels. The private consumption of gas increased 38,988,200 cubic feet, or at the rate of 9·49 per cent.; the increase in the gas consumed for public lighting being 1,412,000 cubic feet, or 14·05 per cent. The number of gas-engines in use is now 102; while the augmentation in the quantity of gas employed for power last year was 8,909,700 cubic feet, or 21·51 per cent. There were 4024 tons more coal carbonized and 47,497,400 cubic feet more gas made last year than in 1906. The coal used being nearly all Japanese, which yields a coke selling at a lower price than that from Australian coal, the return from this residual was less than in 1906, though a greater quantity was sold. There was no demand for pitch; but tar and sulphate of ammonia were well taken up. The fittings department continues to yield a fair profit on the capital employed.

Appended to the Directors' report was a summary of that of the Engineer (Mr. H. King Hiller). He stated that the second retort-house, equipped with electrically driven machinery for handling the coal, &c., was completed and brought into use in September. Condensers and scrubbers to deal with the gas made in this new house were ordered early in the year, and their erection was nearly completed when the report was made. The second gasholder was finished, and brought into use in January last. The following are the figures relating to the working: Coal, &c., carbonized, 41,966 tons; gas made, 495,489,500 cubic feet; yield per ton, 11,806 cubic feet of gas, of an average illuminating power of 16 candles. With regard to distribution, Mr. Hiller reported that the rapid development of new districts and the construction of roads leading thereto had necessitated the greatest length of new and enlarged mains being put down which the main-laying department had ever had to deal with in one year; the total length laid being 12⅝ miles. The quantity of gas sold last year was 461,350,000 cubic feet (an increase of 9·59 per cent.); and that used at the works, unaccounted for, and in stock, 34,139,500 cubic feet.

GAS, WATER, AND GENERAL INVESTMENT TRUST.

A Committee of Investigation Appointed.

Dissatisfaction with the report of the Directors was early manifested at the Annual Meeting of the Trust which was held last Friday, at Winchester House, E.C.; and though the shareholders eventually agreed to pass this, together with the accounts, it was only on the understanding that a Committee of Shareholders should be appointed to investigate the financial position of the undertaking, and that the dividend recommended should not be declared. The report stated that the net revenue for the year ended Jan. 28 last, after making provision for interest on debenture stock and all expenses, amounted to £7575. To this had to be added the balance of £13,229 brought forward, or a total of £20,804. An interim dividend was paid for the half year to July, 1907, on the preferred stock, at the rate of 4½ per cent. per annum, amounting to £7182; and the Directors recommended the appropriation of a further like sum to the payment of a similar dividend for the last six months. After crediting £381 transferred from the reserve account for the equalization of dividends, there would be a balance of £6821 to be carried forward. The Directors had elected Mr. G. T. Moody, who represented a large holding in the Trust, to a seat on the Board.

In moving the adoption of the report and accounts, the Chairman (Mr. J. B. Braithwaite) said the loans from bankers and brokers were £81,000 less than at the same time in the previous year, which, of course, was due to the application of a portion of the money received for the sale of the Utah light and railway business. On the other hand, the investments were about £90,000 more, owing to the investment of some further portion of this money. Loans had increased from £82,323 to £111,191, which was chiefly due to loans to the United Trading and Railway Company. The suspense account for the adjustment of securities remained practically the same as before. During the year, on securities realized there was a profit of £4565, and a loss of £2771. Investments were written down £1999, leaving the balance on that account within a few hundred pounds of what it was in the previous year. They had sold the City of Wellington Electric Light and Power Company to the Corporation; and he had expected the transaction would have been concluded within the year. But, as a matter of fact, the liquidation was not quite completed. When it was, there would be something to come to the credit of this account. While in one way they were glad to dispose of these large investments, which were situated a great distance away, and were consequently rather difficult to look after, they were at the same time very profitable. The City of Wellington had no doubt made a good bargain by purchasing the works for £160,000, of which the Trust's share would be about £60,000. This money they would not be able to invest so profitably again; so that unless they could improve their revenue from other sources, they would have a decrease in the current year. From the revenue account, it would be seen that the Trust had had an unsatisfactory year; the revenue having been £33,713, as against £37,006 in the previous year. In 1907, in order to pay the full dividend on the preferred stock without trenching on the carry-forward, they appropriated £3691 from the reserve account for the equalization of dividends. On the present occasion there was no fund of this kind to draw upon; and as they were £3300 worse off, to pay the full preference dividend they would have to trench on the carry-forward to an extent that would leave only £6821 to be carried forward. They had only earned half the dividend on the preferred stock; the other half would come out of the carry-forward. If, however, instead of paying the dividend now recommended, the proprietors preferred to leave the carry-forward intact, the Board would not object. If the dividend was paid, the Directors would not again trench upon the carry-forward; so that unless they did better this year, it seemed certain there would be some shortage on the preferred stock dividend. In accordance with the undertaking given last year, the Directors had furnished the shareholders with a list of the securities held. As to the valuation of the quoted securities, of course, there had been a serious depreciation. The exact amount was an increase in depreciation of £64,000. The quoted securities now showed a depreciation of £160,505, and the unquoted securities of £18,122. Among the securities held by the Trust—which totalled £808,752—were: Gas and electric lighting, £69,530; water, £39,799; iron, coal, and steel, £20,553; and shipping, £24,077. The remainder of the money was represented by railway, municipal, banking, tramway, mining, Government, and other securities. The investment which was causing them great anxiety, and in which they had a large amount of money at stake, was the United Trading and Railway Company; and if work which was now being carried on in connection with this undertaking was not successful, the Board would probably consult some of the largest shareholders in the Trust as to the future policy.

The motion for the adoption of the accounts having been seconded, a discussion ensued, in the course of which the Directors were somewhat severely criticized in regard to their conduct of the business of the Trust. Mr. Cooper said the list of securities issued clearly showed that the Board in the past were very ill-advised in connection with some of the investments. Mr. Parker, speaking as a debenture holder, remarked that out of the securities held no less than 100 were not paying any dividend at all. He thought 50 per cent. of the debenture capital and all the preferred and deferred stock depended entirely on the outcome of the United Trading Company. Mr. Snell said he was very fearful of the position of the Trust; while Mr. Gordon asked whether there was any limit to the amount of money that the Trust

could place in any one undertaking. In reply, the Chairman said £25,000 was the limit, under the Articles, for any one investment; but the shareholders would remember that, some years ago, they modified the Articles to meet the cases of the Utah Lighting Company, the Wellington Electricity Company, and the United Trading Company. The total amount of money which the Trust had in the United Trading Company was £235,000.

At the request of the meeting, Mr. G. T. Moody, the new Director, gave his views of the situation. He said he had come to the conclusion that the Trust was in an exceedingly grave and critical position. He had asked the Board to withdraw their recommendation that a dividend should be paid. It had not been earned; and in view of the fact that the assets did not more than represent the debenture stock and loans—that was to say, at the present moment there were no assets available for the preferred or the deferred stockholders—the payment of a dividend would be extremely wrong. He had also written the Chairman asking that a Committee of Investigation should be appointed. He suggested that the meeting should be adjourned, and that a few of the shareholders should meanwhile consult with the Board as to the actual position of affairs.

The Chairman said the Directors would welcome such a consultation. He then put the motion for the adoption of the report and accounts, and declared it carried. Subsequently it was decided that the dividend recommended should not be paid; and a Committee were appointed to confer with the Board. When the Committee are ready to report to the shareholders, a meeting will be held for the purpose.

GAS SUPPLY IN THE WEST OF ENGLAND.

It is satisfactory to find, from the reports presented at the annual meetings of three West of England Gas Companies held last week, that the gas business is flourishing in that part of the country. This will be apparent from the particulars given below.

It was reported at the annual meeting of the Dartmouth Gas Company yesterday week that the revenue for the past year was £4692 and the expenditure £4101. The receipts were £329 and the expenses £368 in excess of the previous year; the former owing partly to an increase in the price of gas, and the latter arising mainly from the high price of coal. The number of prepayment meters and stoves in use had increased by 39 during the year, and now reached a total of 590. Owing to the increase in the make and consumption of gas, it had been decided to provide further storage; and the Directors had entered into a contract with Messrs. Willey and Co., of Exeter, for a new gasholder and tank. The report was adopted, and a dividend of 9s. per share declared.

A very gratifying statement was presented at the annual meeting of the Exmouth Gas Company last Tuesday. The make of gas in the past year was 56,276,300 cubic feet; being an increase of 5,052,900 cubic feet, or 9·9 per cent, on the previous year. An addition of 187 to the number of ordinary consumers and of 90 to the prepayment consumers was also recorded, which brings up the total number of gas consumers to 2300. The Chairman (the Rev. C. R. Carr) referred with special gratification to the increased yield of gas per ton of coal; the average make last year being 10,126 cubic feet, against 10,087 cubic feet in 1906. The revenue showed an increase under every head except that of tar. The receipts for residuals as a whole amounted to £2182—a considerable advance; while from private lighting the income was £7618, from public lighting £984, and from meters and stoves £464. Referring to the enormous increase in the price of coal, the Chairman said it threatened to be a great danger to all gas undertakings, unless they raised the price of gas; and this the Directors were most unwilling to do. The Mines (Eight Hours) Bill would have the effect of adding 1s. 6d. per ton to the cost of coal. This meant an increase of 2d. per 1000 cubic feet in the price of gas; and as three-fourths of the consumers belonged to the working classes, it would be an Act of protection for a comparatively small number of workmen to the detriment of all the rest. He hoped the Government would see the error of backing up the comparatively small and selfish section of the community who were pressing for the Bill. The report was adopted; and the usual dividends of 10 and 7 per cent. were declared. The Manager and Secretary (Mr. J. T. Foster) and the rest of the staff were thanked for their loyalty and efficiency.

Mr. J. Kitson presided last Tuesday at the annual meeting of the Torquay Gas Company, at which it was reported that there had been a continued improvement in the sale of gas. The revenue account showed that coal cost last year £15,321, against £12,021 in 1906; while the receipts from sales of gas amounted to £22,962 from private consumers, compared with £22,202 in the previous year, and £1120 from public lighting, against £1119. The total receipts were £35,796, compared with £34,127, an increase of £1669; and the expenditure was £31,808, against £27,914, or £3894 more. The balance to the credit of the profit and loss account was £11,842; and the Directors recommended the payment of the usual dividends of 10 and 7 per cent. A considerable amount of work in extending and enlarging mains has been carried out in various parts of the district. The Chairman said it was very encouraging to find in the past year an increase of 4 million cubic feet in the sales of gas, especially as this followed a record sale in 1906. It was, moreover, remarkable, because the greater portion of the increase was in the last quarter, after the Directors had reluctantly come to the conclusion that it was necessary to advance the price of gas from 2s. 10d. to 3s. per 1000 cubic feet. Coal had cost 16s. 2½d. per ton, against 14s. 4½d. per ton in 1906. Coal owners and merchants were now willing to make contracts on somewhat easier terms; but they wished to guard themselves against a possible rise in price by inserting a protective clause in the contract notes, to the effect that, if the Miners' Bill of the Government passed, 1s. 6d. per ton should be added to the contract price. The Directors hoped the Bill would not become law. The report was adopted, and the dividends recommended were declared. Mr. Kitson, who has been associated with the Company since its formation 49 years ago, was re-elected a Director.

GAS AND ELECTRICITY AT CROMER.

At the Ordinary General Meeting of the Cromer Gas Company last Tuesday, the Directors reported that the gross receipts for the past year were £342 more than in 1906, and that a sum of £2382 was available for distribution. They recommended a dividend at the rate of 2 per cent. per annum (less income-tax), which would absorb £844, and leave £1538 to be carried forward. The Chairman (Mr. J. Lovelace) formally moved the adoption of the report; and the motion was seconded by Mr. H. Rust. Before it was put to the meeting, the Company's Consulting Engineer (Mr. Percy Griffith, M.Inst.C.E.) offered a few remarks on the general position of the Company. He said he was pleased to report after an inspection of the works that they had been maintained in a condition of full efficiency, and that he was satisfied with the general manufacturing operations. Taking into consideration all the circumstances as applied to Cromer, he was of opinion that very few works could show better results with regard to working. For this he thought the Directors should be congratulated, and a word of praise was due to the Manager (Mr. W. H. Archer) for the efficient way in which he had carried on the works since their opening. It was highly gratifying to find that the Directors had succeeded in getting the assessment of the works reduced by £30. The fact that the Company paid £205 a year towards the local rates showed that the undertaking was no small contributor to the welfare of the town. It was a rather curious situation in Cromer that the interests of the shareholders and of the ratepayers were one. It was also an extremely satisfactory position, because it avoided dissension and conflict of interest, and aided to harmonious working towards a common object. He was there that afternoon to speak for the shareholders at large, for the bulk of the Company's capital was, he believed, subscribed by people outside Cromer. But in speaking for them, and in no spirit of criticism of the Directors, he was present to support them in the firm policy of promoting the interests of all the shareholders. He said this in view of the competition of the electric light undertaking, which was likely to be even more serious in the future than it had been in the past. Therefore he thought the Directors should do their best to safeguard their interests to the utmost. He recognized the fact that they were also ratepayers of Cromer; but it was a now ascertained fact that the electric light undertaking was not paying its way. This being a matter of public knowledge, there was no indiscretion on his part in making such a statement. Consequently, he could not but emphasize the fact that the electric light undertaking was being worked at a loss, and that electricity was being sold in Cromer at less than cost price. He was quite aware of the fact that the income was sufficient to cover the cost of manufacture, and that for the present the loss did not fall upon the ratepayers of the town. But he could not call it anything but unfair competition that the Gas Company had to meet; and he had no doubt as to what the results would be were they to compete on level terms. The report having been adopted, Mr. Griffith was elected a Director in place of Mr. Henry Broadhurst, on the understanding that he would relinquish his position as Consulting Engineer; and a resolution was passed to the effect that the shareholders were willing to forego dividends for a time, with the view of improving the Company's financial position.

Gas-Meter Testing in Middlesex.—At the meeting of the Middlesex County Council last Thursday, the General Purposes Committee reported that, as a result of the large number of gas-meters dealt with at the testing-station at Edmonton, there is an average net profit to the Council of about £1000 a year; and they recommended that the salary of the Inspector (Mr. W. F. Barney) should be increased from £250 to £300 per annum by two annual increments of £25 each, the first payable from to-morrow. The Council adopted the recommendation.

Gas beats Electricity at Ipswich.—The Ipswich Education Committee have adopted the report of the Works Sub-Committee which recommended the acceptance of an estimate by the Gas Company for the lighting of the Municipal Secondary School for Girls. Two estimates were received; that of the Municipal Electric Light Department showing a provision of 4819-candle power at a cost of 2s. per hour. The gas lighting estimate provided for 7378 candle power at a cost of 1s. 3d. per hour. It was also stated that the cost of installation of the electric light would be £112, and that of gas £92, to which would be added about £8 for builders' work.

Price of Gas at Halifax.—To a proposal in the Halifax Town Council for the adoption of estimates for the rates for the coming year, Alderman Morley moved an amendment, the effect of which was that the rates should be reduced 1d. in the pound, and the cost of gas be reduced 1d. per 1000 cubic feet. Mr. Skinner, the Vice-Chairman of the Gas Committee, reminded the Council that two years ago the Committee asked to be allowed to reduce the price 1d. per 1000 cubic feet; but the Council refused permission. At that time the Committee could have afforded it, but to-day they could not. The amendment was defeated. A sum of £858 extra is required for public lighting; it being the intention to adopt the incandescent system generally, in place of the ordinary flat-flame burners, the former having been found cheaper and more effective.

Relieving the Rates at West Bromwich.—During a discussion in the West Bromwich Town Council with regard to the contributions given in aid of the rates by the Gas and Electricity Committees, Mr. Baggott expressed the hope that some allowance would be made in connection with each undertaking for depreciation. Alderman Pitt said the Electricity Committee had taken advice on the matter, and their reserve fund now amounted to about £4000. Mr. Wilson (the Chairman of the Gas Committee) said the gas undertaking could well afford to make the contribution of £1390 in relief of the rates. They had paid for extensions and improvements at the works out of revenue, instead of borrowing; and as a result the gas undertaking was in a much better position to-day than it was a few years ago. The Committee would not be satisfied until they reduced their capital account to £100,000; and when they had done this, they would be a little more free with their money. The Electricity Committee will contribute £800 towards the relief of the rates.

SOUTHAMPTON WATER-WORKS MANAGEMENT.

Mr. Matthews Tenders his Resignation.

At a Meeting of the Southampton Town Council, a few weeks ago, some discussion took place with regard to the action of the Water Engineer (Mr. W. Matthews) in accepting the position of Consulting Water Engineer to the Poole Corporation; and subsequently, after fully considering his position, Mr. Matthews felt compelled to address a letter to the Mayor and Corporation tendering his resignation of the position of Engineer to the Southampton Water-Works.

In the course of this communication (which was a very lengthy one), Mr. Matthews pointed out that he had been in the service of the Corporation for 24 years, and that he did not begin to act for the Poole Corporation before receiving the assent of the Southampton Water Committee. On Dec. 22, 1905, upon the personal invitation of the then Mayor of Poole, he was introduced to the Water Committee of the Poole Corporation, with a view to discussing the possibility of his acting for them; and as a result an application was made to the Southampton Water Committee. At a meeting of the Poole Town Council, on Jan. 5, 1906, the Water Committee recommended his appointment to act for them "subject to the consent of the Southampton Corporation being obtained;" and it was only on Jan. 15 that he attended their Water Committee, and received instructions to proceed with the matters they had under consideration—having on Jan. 12, three days before, received the necessary permission from the Southampton Water Committee. Since then he had acted as the adviser or Consulting Engineer to the Poole Corporation throughout the various stages directly connected with obtaining the necessary powers and the transfer to them of the Poole Water Company's undertaking, as well as of the works which the Corporation had to substitute for certain of the Company's works which Parliament put the Corporation under obligation to abandon. These various stages had formed inseparable parts of the whole business for which he was engaged; and he submitted with great confidence that he was justified by the permission accorded by his Committee in assisting the Poole Corporation until their scheme was complete. Nothing had been done in an underhand manner. He had gone about it openly, and talked unreservedly of his connection with the Poole works. It appeared rather to be assumed that his position there, because it had lasted for a considerable time, was in the nature of a permanent appointment, and that he had control of their Water Department generally; but this was not so. The Poole Corporation had a permanent official in the person of their Water-Works Engineer and Manager (Mr. D. Kitchingman), as well as a Resident Engineer and an Assistant Engineer engaged upon the new works.

The concluding portion of Mr. Matthews's letter was in the following terms: "With regard to the inquiry as to the terms of remuneration under which I am engaged by the Poole Corporation, while most respectfully questioning the right of the Corporation to inquire into the subject of a personal arrangement of this character subsequent to their having, as I submit, given the necessary permission to undertake the service without reference to such a question, I have very carefully considered what I ought to do, and though I feel very strongly upon the matter, yet I cannot see my way to be the means of bringing about a conflict between the two Corporations, and therefore have to state that the remuneration is fixed at 3 per cent. upon the cost of the works being carried out, *plus* simple railway fares. Had the question been first addressed to me, I do not think I should have hesitated to give the information; but it was sought over my head in a form calculated to irritate and humiliate me both in the eyes of Southampton and Poole, in a manner which I do not feel was necessary or deserved after so long a service, in which I have devoted many of the best years of my life, without stint, for the benefit of this borough, and can point with, I believe, pardonable pride to what I have accomplished, and with which I have every reason to believe the great body of ratepayers, from the humblest upwards, are well satisfied. After the fullest consideration, I do not feel that I can with any regard for my own self-respect continue to hold the office under the conditions at present existing, and therefore beg to place my resignation in your hands. It is a serious step for me to take, as no one lightly gives up a certainty for an uncertainty; and if the Corporation should consider that my knowledge and limited services could now, or at any future time, be usefully retained for their benefit, I should be pleased to act for them, and so keep in touch with what I must always look upon as some of the most earnest and best work of my life, such as no man lightly desires to sever his connection with. I have no wish to inconvenience you in any way, and will arrange to terminate my engagement at such time as may be most convenient, having regard to work which is about to be started, and to your making arrangements for the future."

The letter came before the Town Council at their meeting last Wednesday, when Mr. Lewis moved that the resignation be accepted. He said there had appeared in the Press a report of the Poole Town Council meeting, when Alderman Carter said that under the general scheme the amount received by Mr. Matthews was £1109 14s. 5d., and in regard to new work £287 5s. 5d.—a total of £1405 12s. 10d. Could anyone suppose that when Mr. Matthews was given permission to assist the Poole Town Council in a friendly way he was to act as Consulting Engineer, and receive anything like £1400 or £1500 in that space of time? The terms of Mr. Matthews's appointment were that he would be required to devote the whole of his time to the duties of his office, and not engage in another business or occupation. No one disputed that Mr. Matthews was a very able engineer; but it had been said in some quarters that because he was an eminent engineer they ought not to cavil at his taking employment with the Poole Corporation, because it gave him a chance of increasing his knowledge and become an expert—at the expense of the Southampton Corporation. He would say deliberately that they paid Mr. Matthews £500 per annum because they wanted the whole of his services.

...ondly, that ...
...-boxes can be ripped op...
...ained, is spreading. So much so has the ...
presented a means for plunder without much trouble that ... men, so it transpired at Birmingham recently, have adopted meter pilfering as a business. Birmingham is only one instance of widespread robbery, which seems to have become universal, and in places in a manner that is somewhat appalling. Prominence has been given, within the last week or two, to two other instances. In the half-yearly accounts of the South Metropolitan Company was this striking item: "Stolen from 4143 slot meters broken open, £465 2s. 5d." The gravity of the statement lies as much in the number of robberies and in the number of meters damaged as in the sum of money actually and criminally appropriated. At the half-yearly meeting of the Tottenham and Edmonton Company, Mr. Corbet Woodall, remarking on the growth in the number of prepayment meter users, also pointed out that the number of thefts from the cash-boxes was growing disproportionately. In 1906 there were 362 robberies, and in 1907 774—in other ...rds, the number more than doubled in the year. ... ...sing robberies involve much time, worry, and ... for increased vigilance on the part ... ...me at the Police Courts ...

(From the "JOURNAL OF GAS LIGHTING" of Feb. 25.)

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Alderman Cawte said the matter ought to come before the Committee, in view of other questions which they were considering at the present time. Alderman Le Feuvre seconded the resolution, drawing the attention of the Council to extracts from the minutes in the years 1895-6. He added that practically the greater part of Mr. Matthews's work was not done in Southampton. His application was originally for one day. Then he became a permanent official of the Gosport Water-Works Company, and now a permanent official of the Poole Water-Works. Alderman Emanuel said he was sorry to see no one standing up for an official who had served them for 24 years. The question was one of great sorrow to many of them, especially those who could go back the 24 years, and who knew that it was from Mr. Matthews's energies at that time that the water-works were in the splendid condition they found them in to-day. Mr. Bowyer said they ought to censure the Water Committee for not having more clearly defined the limits of the resolution which gave Mr. Matthews leave to act for Poole. After much further discussion, the resolution accepting the resignation was agreed to.

Commenting on the proceedings in the Town Council, the "Hampshire Independent" says: "The most important question before the meeting was the resignation of the Water-Works Engineer—a deplorable act, consequent on the constant harrying of Corporation officials which is the settled policy of certain members of the Corporation. The circumstances which prompted Mr. Matthews to take this serious step are well known. We do not hesitate to say that Mr. Matthews is one of the best officials that the Southampton Corporation—or, indeed, any other corporation—ever had or could possibly have. He came to Southampton as successor to the late Mr. George Manwaring, at a time when the water supply of the town, drawn from the open River Itchen, at Mansbridge, was a disgrace to a civilized community—no reproach to Mr. Manwaring to state this, because he had to deal with things as they were, and not as he would have liked them to be. Under the advice of Mr. Whitaker, the Government Geologist, the Otterbourne site was selected as the source of the new supply; and for the scheme, which was one of the cheapest and most efficient ever carried out in England, Mr. Matthews was, and has been ever since, solely responsible. Some very unkind observations were made on Wednesday; but Mr. Matthews's unblemished record of 24 years' service is a sufficient vindication of his position, and his high-standing in his profession will not be affected by the attacks made upon him."

The fifteenth annual meeting of Sir William Arrol and Co., Limited, was held in Glasgow, on Monday last week—the Chairman (Sir William Arrol) presiding. He stated that the profit, with the balance brought forward, was £46,558. After meeting prior charges, preference dividend, &c., £34,745 were available for the ordinary dividend, which it was proposed should be 10 per cent.; leaving £8677 to be carried forward. The report was adopted.

WATER SUPPLY OF CAMBRIDGE.

Local Government Board Inquiry.

At the request of the Corporation and University of Cambridge, an inquiry has lately been held, on behalf of the Local Government Board, by Dr. Theodore Thomson, Barrister-at-Law, and Mr. P. M. Crossthwaite, M.Inst.C.E., in regard to the water supply of the city and the circumstances which are calculated to affect it.

The Corporation and University were represented by Mr. H. St. J. Raikes, who was supported by the Town Clerk (Mr. J. E. L. Whitehead), the Borough Surveyor (Mr. E. Wareham Harry), and the Medical Officer of Health (Dr. Duncan Forbes); Mr. Balfour Browne, K.C., Mr. Holman Gregory, and Mr. M'Mullan, jun., watched the proceedings on behalf of the Water Company, whose Manager and Secretary (Mr. W. W. Gray) was in attendance.

In opening the inquiry, Mr. Raikes stated that the two authorities he represented were not present in any alarmist spirit, but were prepared to look rather to the future than to actually say that at the present time there was anything wrong. The area from which the water supply was derived was a large basin of chalk lying to the south-east of Cambridge. The subsoil was mainly chalk, overlaid by a thin layer of loam, from 1 foot to 4 feet thick; the chalk being from 60 to 100 feet thick. The chalk rested upon a bed of gault from 125 to 130 feet thick, from which it was separated by only a very narrow stratum known as the Cambridge greensand. The chalk, or chalk marl, was divided by layers of harder material; the highest and thickest of which was the Burwell rock, which was very much fissured, and as a result it bore water very freely. The water was dealt with, so far as the town was concerned, at two pumping-stations. One was situated at Cherryhinton, some two miles from Cambridge, and consisted of three wells, two lined with iron and the other with brick. These wells were sunk in the chalk marl, and one of them was pervious to the water generally in that stratum. Besides these wells there was a bore from the gault to the greensand; and from it a certain quantity of water was drawn. But the main supply which was dealt with at these wells was not derived from the immediate locality, but was piped to them from what was called the "springhead" at the cross roads of Cherryhinton, which spring represented water coming from the Burwell rock. The second pumping-station was in the village of Fulbourn, situated 2½ miles from Cherryhinton, and consisted of an iron well connected by a cylinder with a supply well sunk some 70 feet in the chalk marl—that was to say, very nearly down to the gault below it. The average amount of water pumped daily at the two stations was, as regarded Cherryhinton, some 800,000 gallons, and as regarded Fulbourn some 750,000 gallons. The water from both of these stations was contained in a reservoir in the hill, from which the surrounding district was supplied, with the exception of the villages of Fulbourn and Cherryhinton, which he understood were served direct from the rising

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We shall have more to say about this Oven next week.

mains of the Water Company. It seemed that at the present time the water supply was pure, both chemically and bacteriologically; but there were three sources of contamination—the two villages of Cherryhinton and Fulbourn and the Fulbourn Asylum. Some years ago, a sewer was constructed to improve the drainage of Cherryhinton; but as it was found to be faulty, and ran close to the pumping-station, there was a direct likelihood of the contamination of the water coming through the chalk marl. The second possible source of contamination was Fulbourn village, which had no system of drainage whatever beyond cesspools and the discharge of the sewage into ditches. In the case of the cesspools, it would probably be found that some of their contents penetrated as far as the Burwell rock, which was a very pervious stratum; and so there was risk. The third possible source of contamination was the Fulbourn Asylum. This was situated four miles from Cambridge and stood on the high ground more or less between the two pumping-stations that he had referred to. But it was a good deal nearer to Fulbourn than to Cherryhinton. The Asylum and most of the ground that went with it stood above the Burwell rock; and they had to consider carefully certain propositions which were now put forward for dealing with the sewage of the establishment. Having indicated what had been done in this direction, Mr. Raikes stated that Dr. Thresh had been called in to advise the authorities; and he gave particulars of the Doctor's proposals and of the experiments he had conducted. In conclusion, he repeated that the authorities he represented did not wish to pose as alarmists in the slightest degree. They did not say the water was suspect at the present time, or that there was any immediate possibility of danger. Their only wish was to have such an inquiry as would satisfy not only the public, but those who were intimately connected with the Town and University, that the water supply was not only now as it should be, but that its quality would be ensured for many years to come.

The first witness called was Professor Thomas M'Kenny Hughes, Professor of Geology in the University. He said he had made a study of the geology of the district from which the water supply was drawn, and had taken very considerable interest in the question of its purity, having from time to time visited the pumping-stations of the Water Company at Cherryhinton and Fulbourn, as well as the sewage works at the Fulbourn Asylum. With regard to Cherryhinton, the village was built chiefly upon the marl, and the houses, the cesspools, and so forth were right across the Fulbourn rock. There was no doubt whatever in his mind that this was the principal water-bearing stratum; and it was the one they would seek if they wanted to get water. With regard to the Fulbourn village, he should certainly say there was danger of sewage contamination of the water pumped at this station. With regard to the Asylum, the disposal of sewage on the proposed area might or might not be a potential source of danger.

At this point, Mr. T. Musgrave Francis, the Clerk to the Asylum Board of Visitors, said the interest of the Asylum in this matter was very limited indeed. They simply wanted to know whether or not Dr. Thresh's scheme was to be authorized by the Town Council. It was a very economical one, and was sanctioned by the County of Cambridge and Isle of Ely; but the Town of Cambridge withheld their consent for two reasons, both of which he thought were very illogical. One was that it was not sufficiently costly, and the other that it did not protect their water supply from all possible sources of danger.

Other evidence having been given, Dr. Thresh was called. He said he was quite convinced that if the Asylum sewage was purified on the lines he had proposed, it would be higher purification than the chemical treatment suggested; and when it got to the general body of water underground, its ultimate outlet would be on the Cam, and no part could reach the water supply of Cambridge.

Professor G. Sims Woodhead gave evidence on behalf of the County Council. He said he had been adviser to the Water Company for a considerable period. He was of opinion that Dr. Thresh's scheme, though not an ideal one, did away with any potential danger of which they had been speaking; and until there could be some system by which the whole of the sewage from the two sewers concerned could be brought to the surface and distributed upon some gathering-ground, he considered the best had been done under the circumstances. He believed that the water was satisfactory, and that the Company were making great efforts to secure a good supply.

Mr. Balfour Browne said that, although the Company had not asked for the inquiry, they were exceedingly pleased it had taken place, in order that the public anxiety which was felt—ignorantly felt by some people in Cambridge—should be allayed. Dr. Thresh and Professor Sims Woodhead had said that the water supply was at the present time pure, both chemically and bacteriologically; and if this was the case, he confessed that he did not see what they were there about. The Asylum authorities were doing their best to safeguard the future water supply, both to their own well and to Cambridge; and, further than that, the county authorities had done their best. What more remained to be done? He did not know. Under the old conditions, no single trace of a pathogenic germ had been found. There were present Mr. Gray, the Manager of the Company, who knew all about it; Mr. Charles Hawksley, their Consulting Engineer, Professor Percy Frankland, and Professor Whitaker. Their water-works had not been impugned, and there was nothing to answer.

Mr. Raikes said the inquiry was not directed to making any examination of the Water Company's present sources of supply, nor of the water they now supplied, but merely to finding out whether a certain proposed scheme would be likely in the future to contaminate that supply. The Company had named themselves the defendants.

The inquiry was then adjourned to allow of the Inspectors visiting the district and inspecting the places mentioned. On resumption of the proceedings at a subsequent date, it was ascertained that no one had any further representations to make; and accordingly Dr. Thomson announced that he and his colleague would report in due course.

The growth of the water undertaking of the Brighton Corporation since its acquisition in 1872 was recently referred to by the Water Engineer (Mr. James Johnston, M.Inst.C.E.) in the course of a lecture. He stated that in the year named the population was 104,000, and the area supplied 5 square miles; whereas present figures for the population are 200,000, and the area served is 44½ square miles.

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NOTES FROM SCOTLAND.

From Our Own Correspondent.

Saturday.

Had it not been for unpropitious weather—rain falling heavily all the time—the visit of the Western District of the Scottish Junior Gas Association this afternoon to the shipbuilding yard of Messrs. W. Beardmore and Co., Limited, would have been an exceedingly pleasant one. As it was, it was quite a lesson to everyone interested in the equipment of engineering works. We all know how beneficial it is to have an entirely new gas-works erected, instead of patching up an old works. Here was a new shipbuilding yard—only four years old—in which there is to be seen everything which can be devised for promoting economy in working and facility in output. The whole works were fitted to impress the members with a sense of the great strides which have been made in recent years in engineering and constructional work. To the visitors the interest of the visit was in the power-house and the gas-producing plant. The extensive scale of the work was, in itself, impressive. An installation of so many gas-engines, of such large dimensions, and operating such heavy machinery, had been seen by probably none who were present. It was a bold policy on the part of the Company to discard steam altogether, and to rely upon gas as their sole prime mover. But they have done it, and with success; and they have thus taken the lead in these northern parts in demonstrating the feasibility of wedding gas and electricity for the provision of power on a large scale. The producer-gas plant was looked upon with great interest—the advent of the vertical retort being in the background with some. What impressed the visitors most, as it must everyone who is privileged to see the place, was the small space occupied for the production of so much power; the simplicity and easy working of the plant; the cleanliness of the work; and the small amount of labour required.

In the Glasgow Town Council on Thursday, the Sub-Committee on Improved Lighting of Private Streets, Courts, and Stairs reported that, at a meeting on the 6th inst., Mr. Barrie moved that it be remitted to the Parliamentary Bills Committee of the Corporation to give effect to the proposal that the existing powers of the Corporation under the Glasgow Police Act, 1866, be continued, with this variation and alteration—that, following the precedent and authority of the Burgh Police (Scotland) Act, 1892, the charge for lighting private streets and courts be increased from 15s. to 25s. per lamp per annum, and the charge for lighting common stairs from 10s. to 20s. per burner per annum; and with the further proviso and qualification that the allowance to proprietors of 20 per cent. in respect of the payment, in the first instance, by them of the charge for stair gas, contained in the Glasgow Police Act, 1866, be restricted to 10 per cent. on the new and increased charge for stair gas. These proposals went forward to the Town Council as a recommendation. Speaking in support of it, Mr. R. Graham said that £23,000 was the deficit which fell every year upon the rates, on account of the extra cost of lighting private stairs. The recommendation was adopted by a large majority, as against a proposal to procure further information. For the lighting of stairs the Corporation have adopted an inverted incandescent burner. The adaptation is the invention of Mr. A. Wilson, the Gas Engineer. About 600 of these lamps have been already fitted up; and they are being daily asked for.

The great cause relating to the theft of a cash-box containing £43 from the office of the Dundee Gas Commissioners on Oct. 26 last came to an end on Tuesday, without the mystery being in any way cleared up. George T. Laburn, who has been a clerk in the office for fifteen years, was put on trial, before Sheriff-Principal Ferguson and a Jury, charged with the theft. Great preparations had been made for the trial. Mr. Lyon Mackenzie, one of the Crown Counsel, was sent from Edinburgh to prosecute; and the accused was defended by Mr. R. Munro, advocate, from Edinburgh. The trial lasted for two days; the prosecution occupying the whole of the first day. In the end, the Jury returned a verdict, by a majority, of "not guilty"—the figures being, for "not guilty" 8, and for "not proven" 7. The prosecution, in reality, proved nothing against Laburn. What was proved was that it was his cash-box which was taken away; that there had been disappearances of money from the gas office before the theft of this box; and that, in consequence, two men had been dismissed, and one reduced and put to work where he had nothing to do with money. There was some discrepancy in the evidence as to the number of keys in existence for the strong room and the cages within it. The case was so weak that the prosecuting Counsel would have been justified in withdrawing it when he had led all his evidence, and consenting to a verdict of "not guilty." But he did not; and on the second day the defence easily established that the locks and keys in use were in a very unsatisfactory condition, and Laburn himself denied the theft. Laburn may almost be said to have been made a victim to public clamour; for had it not been for the magnification of the offence in Dundee, and the necessity for doing something to allay local feeling, it is highly improbable that any prosecutor would have brought such a case into Court at all. The unfortunate man is, however, not to suffer by what has happened, except in his feelings, because the Town Council, at a meeting on Thursday, gave instruction, unanimously, that Laburn be reinstated in his post; and they appointed a Committee to pursue inquiries into the administration of the department of the Gas Treasurer.

In Dundee this week there was, before the Criminal Court, another case involving a charge of theft of gas money. Andrew Johnston was charged with stealing 2s. 7d. from a prepayment gas-meter in his mother's house in Gellatly Street. I have before commented upon what appeared to me to be the inadequacy of the sentences meted out to pilferers from prepayment gas-meters by Sheriff-Substitute Campbell-Smith, of Dundee. On this occasion, it was an Hon. Sheriff-Substitute who was on the bench; and he took a course which more fits the crime than we have hitherto been accustomed to in Dundee. His remark was: "This is a species of theft which ought to be dealt with firmly;" and he pronounced a sentence of thirty days' imprisonment.

The Lerwick Town Council, at their last meeting, had before them the report of a Committee appointed several months ago to consider a proposal to procure a transfer of the undertaking of the Lerwick Gas

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Company. The Committee submitted the minute of a conference which they had with the Directors of the Company, in which it was stated that, after discussion, the Directors replied that, considering the large amount that the Company had expended, and the outlays which exceeded the share capital, they would not be justified in recommending the shareholders to accept the sum of £4000. The Directors having retired, the Committee resolved to make application for the following information: The amount of outlay upon works over and above the share capital; the income and expenditure, and the amount paid in wages annually during the last twenty-five years; and the gross quantity of gas manufactured during the last five years. The Town Clerk wrote to the Company asking for this information, and received a reply stating that the Directors had considered the letter, and that they were willing to provide all reasonable information, but that the expense statistics desired by the Council were beyond what, at this stage of the negotiations, the Directors were prepared to give; and they suggested that the figures supplied in the annual statement of revenue should be ample. At a second meeting of the Committee, the Town Clerk read this reply of the Directors; and the Committee instructed him to write to the De Laitte Syndicate, Limited, of Edinburgh, asking them for information regarding their system. In the course of a discussion in the Council, Councillor Sinclair stated that, owing to the refusal of the Company to supply the figures they wanted, they could make no headway, and they thought it better to obtain information regarding an alternative scheme. Provost Porteous said there could be no objection to the Committee taking this course, although it was outwith their remit. He afterwards remarked that there was a difference of £3000 between the parties. It was agreed to leave the matter in the hands of the Committee, to make further inquiries, and to report to the Council.

The Directors of the Doune Lighting Company report a net profit for the past year of £35, to which is added £12 brought forward. They recommend a dividend of 5 per cent.

CURRENT SALES OF GAS PRODUCTS.

LIVERPOOL, *March* 28.

Sulphate of Ammonia.

As the close of the month has been approached, demand has become keener; and within the past few days there has been a further advance in values, available supplies being limited. Buyers abroad, however, have not kept pace with the market, although there has been a fair amount of direct inquiry. Home demand has been good; buyers having supplied themselves rather sparingly in advance, notwithstanding favourable prices. The closing quotations are £12 3s. 9d. per ton f.o.b. Hull, £12 6s. 3d. per ton f.o.b. Liverpool, and £12 7s. 6d. per ton f.o.b. Leith. The forward position has not attracted corresponding interest; makers being firm at £12 5s. per ton for July-December delivery, and buyers being unwilling to pay the price.

Nitrate of Soda.

This article is quiet in all positions; demand from consumers having so far been disappointing, and supplies being abundant. The spot prices are 10s. 10½d. and 11s. 1½d. per cwt. for 95 per cent. and refined qualities respectively.

LONDON, *March* 30.

Tar Products.

The markets for tar products remain quiet all round, with very little change in any quarter. There is no alteration in the market for pitch, and very few sales have taken place for either prompt or forward delivery. Business is again reported on the east coast at 19s. 6d. per ton; while in London 20s. 6d. is stated to have been accepted. For forward, manufacturers prefer to wait the course of events before selling further. Creosote is quiet, and business has been done in London for prompt delivery at 2¼d. per gallon. Benzol, 90 per cent., remains in about the same position. There are sellers in London at 8¾d., and in the North at 8d. Benzol 50 to 90 per cent. and toluol are difficult of sale; consumers of these articles being well bought for some time to come. Solvent naphtha is unaltered; and no sales of importance have been made. Carbolic acid remains about the same. Continental consumers report having purchased at 1s. 6¼d. f.o.b. east coast; but prompt parcels have been placed by makers at a little over this figure. Crystals are quiet, and sales are difficult to negotiate. Naphthalene remains in about the same position for the refined quality. Creosote salts are however, rather easier; there being more offering.

The average values during the week were: Tar, 12s. 6d. to 16s. 6d., *ex* works. Pitch, London, 20s. 6d. to 21s.; east coast, 19s. 6d. to 19s. 9d.; west coast, 18s. 9d. to 19s. 9d., f.a.s. Benzol, 90 per cent., casks included, London 8⅝d. to 8¾d., North 8d. to 8⅛d.; 50-90 per cent., casks included, London 8⅛d. to 8¼d., North 8d. Toluol, casks included, London 9¼d. to 9⅜d., North 8½d. Crude naphtha, in bulk, London 3¾d. to 4d., North 3⅜d. to 3⅝d.; solvent naphtha, casks included, London 10d. to 10½d., North 9d. to 9½d.; heavy naphtha, casks included, London 11d. to 11½d., North 10d. to 10½d. Creosote, in bulk, London 2½d. to 2⅝d., North 2⅛d. to 2¼d. Heavy oils, in bulk, London 2¾d. to 2⅞d. Carbolic acid, 60 per cent., casks included, east coast 1s. 6⅜d. to 1s. 7d., west coast 1s. 6¼d. to 1s. 6½d. Naphthalene, £4 10s. to £8 10s.; salts, 35s. to 40s., packages included and f.o.b. Anthracene, "A" quality, 1⅛d. to 1⅜d. per unit, packages included and delivered.

Sulphate of Ammonia.

The market for this article is very firm for immediate delivery, for which high figures have been paid. The principal London Gas Companies quote from £12 5s. to £12 6s. 3d. for delivery to the end of the year. They have none to sell for prompt; but were this the case they could probably secure £12 7s. 6d. for same. The ordinary makes are stated to have been sold at £12 5s. on Beckton terms. In Hull, sales are reported for immediate delivery of the best qualities at £12 5s.; and the market at this place is from £12 2s. 6d. to £12 5s. In Liverpool, the value may be put down as £12 5s. to £12 6s. 3d. In Leith, £12 6s. 3d. has been paid for immediate delivery, and £12 7s. 6d. is now offered; but there is very little obtainable even at this price. It would appear from the figures which are being paid for prompt delivery

SEASON 1908.

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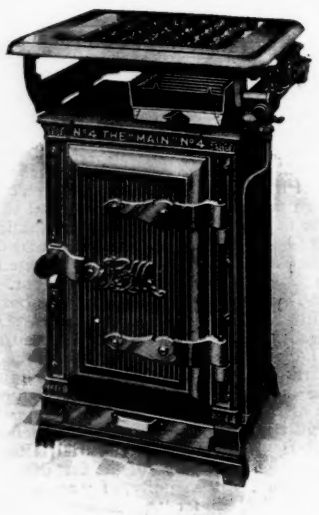

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that dealers will have some difficulty in obtaining quantities which they have to ship during the month of April, owing partly no doubt to the fact that the consumption in England has been very much greater than was looked for.

COAL TRADE REPORTS.

Lancashire Coal Trade.

Colliery owners, sympathizing with millowners, iron founders, shipowners, railway companies, gas companies, iron and steel merchants and manufacturers, are all eagerly endeavouring to induce the Government to withdraw the Mines (Eight Hours) Bill. Colliery proprietors, like those who use their coal in large quantities, are for once in agreement, and for exactly the same reasons. They apprehend a shortage, and, consequently, increased prices for this indispensable commodity. If it were for eight hours' working days outside mines, colliery proprietors would not object so much, because their pockets would not be materially affected thereby; but as they would be the first to bear the brunt of the change, they have thrown in their lot with other anticipated sufferers, with this difference—that if the Eight Hours Bill passes, they will put the extra cost upon their customers. It is the public, in whatever form that public rears its head, that will have to bear the burden. Already, in the matter of gas coal, colliery proprietors endeavour to bind those who buy gas coal to agree to pay another 1s. 6d. per ton on incompleted contracts from the moment the Eight Hours Bill becomes operative. Twenty thousand tons of English gas coal are now wanted by a town in Holland, for which tenders are being asked in this country, and which must be sent in by this day week. Prices of all kinds of Lancashire coal show no quotable alteration.

Northern Coal Trade.

There is considerable activity in the coal trade of the north-east. In some of the branches, the activity is very marked for a season of the year that is usually a quiet time, giving place to the fuller trade that follows the opening in the spring of North of Europe ports. Best Northumbrian steam coals are full in demand, and some of the collieries have their output booked ahead for weeks—the current quotations for prompt or early delivery being from 12s. 4d. to 12s. 6d. per ton f.o.b. Second-class steams are 11s. to 11s. 6d. Steam smalls vary from about 7s. to 7s. 6d., and are scarce and firm. In the gas coal trade, the output is well taken up, and the prices are steady. Ordinary kinds are quoted from about 10s. 3d. to 11s. per ton f.o.b., according to quality, while "specials" are about 12s. per ton. Among the contracts that are now reported are those for the Italian Union de Gaz; and it is said that nearly half-a-million tons have been arranged for, to be shipped, as required, to Genoa and other ports. The prices are believed to vary from about 10s. 1½d. and up to 11s. 6d. per ton f.o.b., according to the quality. The coke trade is firm; but gas coke shows some ease. For export, it is quoted from about 14s. to 14s. 6d. per ton f.o.b. in the Tyne.

Scotch Coal Trade.

There is no improvement to record in the condition of the coal market. Ell and splint for shipment are in poor request; and other sorts are also plentiful. Time is being lost at the collieries for want of orders. The prices quoted are: Ell 10s. 3d. to 11s. 3d. per ton f.o.b. Glasgow, splint 11s. 3d. to 11s. 6d., and steam 10s. 6d. to 10s. 9d. The shipments for the week amounted to 244,402 tons—an increase of 14,314 tons upon the preceding week, but a decrease of 8066 tons upon the corresponding week of last year. For the year to date, the total shipments have been 2,500,333 tons—a decrease of 353,772 tons upon the corresponding period of 1907.

Gas Suffocation Cases in Scotland.

Two cases of suffocation by gas are reported to have occurred in Scotland last week. The first was that of Anton Gulstad and his son Alexander, natives of Denmark, who were suffocated by gas in Glasgow. Their residence was at Calder Street, Govanhill; but the elder of the two men was proprietor of premises at 60, Clyde Place, which were used as an emigrant house in connection with the Allan and Anchor lines. On Monday evening, they left their home in Calder Street for the house. Their non-return did not create much anxiety, because the business is very active just now. On Wednesday evening, one of the family called at Clyde Place, but did not get admission. Thinking the two men were out, the visitor went home. On Thursday, however, the premises were still closed; and the family then getting alarmed, informed the police. The house was forcibly entered, and both men were found lying dead on a couch upon which they had evidently gone to sleep. It appears that while they slept one of the weights of the gasalier had become detached, and that the gasalier had slipped down as far as the remaining weight and chain would permit. No water was found in the pipe, and apparently in that way the gas had escaped and gradually filled the apartment. A further incident of poisoning by gas is reported from Cupar. David H. Johnstone, a licensed grocer and provision merchant there, and his wife were the victims. In this case, it was discovered that the poisoning had not been accidental, as had been at first supposed, but had been pre-arranged. Two of Mr. Johnstone's nephews were employed in the shop, and when they called at the dwelling house on Friday morning, to obtain the shop keys, they failed to get anyone to answer to their ringing of the door bell. Suspecting that something untoward had happened, a brother of Mrs. Johnstone was sent for. The house was entered by a window, and a note to the brother-in-law from each of the spouses was found, both bidding him an affectionate good-bye. Mrs. Johnstone had suffered much from mental depression; and it was known that Mr. Johnstone had had business worries, and had not been well. On the finding of the letter, the house was searched. The bathroom door was found to be fastened. It was forcibly entered, and the husband and wife were found, partially dressed, lying upon an improvised bed on the floor. They were both dead. The gas-pipe in the bathroom had been purposely cut, and the keyhole was stuffed with paper.

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Electricity Extension Opposed at Bury.—A meeting convened by several large ratepayers has been held at Bury to discuss a proposed scheme of the Corporation for the establishment of new electricity works at Chamber Hall, and "to take any action which may be decided upon to prevent the rates of the borough from being burdened by this (£100,000) gigantic expenditure." The state of matters having been fully explained, it was decided to call upon the Mayor to convene a public meeting before the holding of a Local Government Board inquiry with regard to the borrowing of the necessary money.

Sales of Gas Shares.—At a local sale by auction last week, £200 of 4 per cent. York Gas Company's consolidated ordinary stock sold at £91 10s. per cent., £600 worth at £90 2s. 6d. per cent., and £175 worth at £90 5s. per cent. Ten ordinary £10 shares in the York Water Company realized £24 13s. 9d. each. At another sale, £425 of 4 per cent. consolidated ordinary stock in the York Gas Company sold at from £92 7s. 6d. to £92 10s. per cent. Twenty £10 York Water Company's preference shares sold for £9 1s. 3d. each; and 69 ordinary £10 shares fetched from £24 12s. 6d to £24 10s. each. Twenty ordinary shares (1878) realized £17 1s. 3d. each. Eight original £10 shares in the Whitby Gas Company were sold for £13 each.

Sequel to the Fatal Explosion at Windsor Street Gas-Works.—Fireman Lissamore, of the Aston brigade has been presented by the Mayor with a badge of merit, a medallion, and a sovereign, in recognition of his bravery on the occasion of the recent fatal explosion at the Windsor Street Gas-Works of the Birmingham Corporation. He was the first man to volunteer to enter the burning trench in which the explosion occurred, and endeavour to rescue the two men who were believed to be buried under the *débris*. Unfortunately the men were already dead; but Lissamore succeeded in recovering the bodies, and was complimented on his bravery by Mr. Isaac Bradley, the Coroner, at the inquest, and specially mentioned in a letter sent by the Birmingham authorities to the Aston brigade, enclosing £5 towards the expenses in connection with the men's recreation room. The badge of merit carries with it an additional 6d. per week pay.

Monte Video Water-Works Company, Limited.—At the ordinary general meeting of this Company last Thursday, the Chairman (Mr. James Anderson), in moving the adoption of the report, noticed last week, stated that there had been a record increase in the Company's business; the additional number of services in operation at the close of the past year being 2471 in excess of the figure for the previous year. Their tariff was undoubtedly a high one, inevitably so owing to the costly nature of their works consequent on the great distance from Monte Video of the nearest source of supply. Furthermore, the whole of the water had to be subjected to an elaborate system of filtration, and then pumped a distance of 22 miles to their distributing reservoirs. At the end of 1906, the Board decided to grant, as from April 1 last year, a reduction of 25 per cent. to those customers who paid the highest domestic rate. The Directors calculated that this might affect the Company's revenue by £9000; and this was in addition to a reduction in the meter-rents, equal to about £5000 per annum, which had been granted a few months previously. There had, however, been not only no falling off in the revenue after nine months' experience of the lowering of the tariff, but a substantial increase both in gross and net income. Important additions to the works had been agreed on between the Company and the Government. The report was adopted.

A Gas-Works Accident at Oldham.—Samuel French, a fitter employed at the Higginshaw Gas-Works of the Oldham Corporation, died from injuries received through falling about 15 feet when repairing a travelling crane; and at the inquest the Jury returned a verdict of "Accidental death." Joseph Shell, who was in charge of the job, said deceased mounted a ladder, which must have slipped. He (Shell) had not tied the top of the ladder, as he had not anticipated any risk. He would, however, in future see that the tops of ladders were fastened.

Beating the Yorkshire Coal Owners.—The "Pall Mall Gazette" says: "After a lengthy struggle, the Yorkshire coal owners have had formally to admit defeat in their dispute with the Humber trawling companies over the fuel supplies for the current year; and this conclusion will have most far-reaching effects on the coal trade of the country. The collieries in the first instance asked 12s. per ton; and then, having made their contracts with the railway companies at 11s. 3d., they reduced their demands to this figure. The trawler owners retaliated by obtaining supplies from the Tyne, and, notwithstanding a further reduction of the Yorkshire prices to 10s. 6d., the bulk of the contracts have been placed at Blyth from April 1 forward."

Huddersfield and Linthwaite Gas Supply.—The minutes of the Gas Committee which were adopted at the last meeting of the Huddersfield Borough Council stated that at a meeting on Feb. 20 the proceedings of a Special Sub-Committee, with reference to the Linthwaite gas supply and the purchase of the mains and pipes owned by the Slaithwaite Gas Company, were read; and the Chairman reported the result of an interview which he and the Gas Engineer had had with the Chairman of the Slaithwaite Gas Company, and that the sum of £1100 had been agreed upon. The action of the Chairman was approved; and the Town Clerk had been instructed to prepare and complete such agreement as might be necessary for the purchese of the mains, pipes, and meters, within the Linthwaite area.

Mr. J. F. Wright, the Chairman, in proposing, at the tenth general meeting of Messrs. C. & W. Walker, Limited, the adoption of the report which was noticed in the "JOURNAL" for the 17th inst. (p. 726), said that the satisfactory character of the balance-sheet was in a large measure due to the alterations and improvements carried out in the works and foundry. Had they not undertaken those alterations, he did not think the profits of the past year would have been so large. It was interesting to note that the reserve fund was nearly equal to two-thirds of the preference shares, which made these shares a safe and desirable investment. As to the coming year, he was pleased to say that all the departments were fully employed; and the prospects were good. They had a larger quantity of work in hand than at this time last year, and at fairly remunerative prices. There were more inquiries about gas plant and structural steelwork; and he could see no reason why they should not have as good a year as last. The report having been adopted, Mr. C. H. Wright, the retiring Director, was re-appointed, and in returning thanks said he wished to announce, without comment, that in the early part of this year the firm obtained a large contract in Canada which must have gone to the Americans but for the preferential tariff between Canada and this country. It was agreed, by a majority, to vote the Directors an additional fee of £500 for their services during the past year, and that in future they be paid a fee of 1000 guineas per annum instead of £500.

GAS COMPANIES' STOCK AND SHARE LIST.

Referred to on p. 818.

Issue.	Share.	When ex. Dividend.	Dividend or Dividend & Bonus.	NAME.	Closing Prices.	Rise or Fall in Wk.	Yield upon Invest. ment.
£			p.c.				£ s. d.
590,000	10	Oct. 11	10†	**Alliance & Dublin** 10 p.c.	20—21	..	4 15 3
268,324	10	,,	7†	Do. 7 p.c.	14—15	..	4 13 4
310,000	Stk.	Jan. 16	4	Do. 4 p.c. Deb.	100—103	..	3 17 8
200,000	5	Oct. 30	7	**Bombay, Ltd.**	6¼—6¾	..	5 3 8
40,000	5	,,	7	Do. New, £4 paid	4½—5	..	5 12 0
50,000	10	Feb. 27	14	**Bourne-mouth Gas and Water** 10 p.c.	27—28	..	5 0 0
51,810	10	,,	7	B 7 p.c.	16½—16¾	..	4 3 7
53,200	10	,,	6	Pref. 6 p.c.	14—15	..	4 0 0
380,000	Stk.	,,	12½	**Brentford Consolidated**	242—247	..	5 1 3
300,000	,,	,,	9½	Do. New	180—185	..	5 2 8
50,000	,,	,,	5	Do. 5 p.c. Pref.	118—123	..	4 1 4
206,250	,,	Dec. 13	4	Do. 4 p.c. Deb.	100—105	..	3 16 2
220,000	Stk.	Mch. 12	11½	**Brighton & Hove Orig.**	195—205	..	5 9 9
246,320	,,	,,	8½	Do. A. Ord. Stk.	152—157	..	5 5 1
460,000	20	Mch. 27	10	**British**	42—43*	..	4 13 0
104,000	Stk.	Feb. 13	6	**Bromley, Ord.** 5 p.c.	116—119	..	5 0 10
165,700	,,	,,	4½	Do. do. 3½ p.c.	86—89	..	5 1 2
500,000	10	Oct. 11	7	**Buenos Ayres (New) Ltd.**	11¾—12	..	5 16 8
250,000	Stk.	Dec. 13	4	Do. 4 p.c. Deb.	93—95	..	4 4 3
130,000	20	Mch. 12	7½	**Cagliari, Ltd.**	25—26	..	5 11 6
100,000	10	—	—	**Cape Town & Dis., Ltd.**	4—6	..	—
100,000	10	Apl. 26	4½	Do. 4½ p.c Pref.	7—9	..	5 0 0
50,000	50	Nov. 2	6	Do. 6 p.c. 1st Mort.	48—50	..	6 0 0
100,000	Stk.	Dec. 30	4½	Do. 4½ p.c. Deb. Stk.	92—94	..	4 15 9
157,150	Stk.	Feb. 27	5	**Chester** 5 p.c. Ord.	105¼—107½	..	4 13 0
1,493,280	Stk.	Mch. 12	5⅛	**Commercial** 4 p.c Stk.	103—108	..	4 16 4
560,000	,,	,,	5	Do. 3½ p.c. do.	100—105	..	4 15 3
475,000	,,	Dec. 13	3	Do. 3 p.c. Deb. Stk.	82—84	..	3 11 5
800,000	Stk.	,,	6⅛	**Continental Union, Ltd.**	115—120	..	5 8 4
200,000	,,	,,	7	Do. 7 p.c. Pref.	140—145	..	4 16 7
460,170	Stk.	—	5⅛	**Derby Con.** Stk.	122—123	..	4 9 5
55,000	,,	—	4	Do. Deb. Stk.	103—105	..	3 16 2
148,995	,,	—	—	**East Hull** 5 p.c. Ord.	100—103	..	—
486,090	10	Jan. 30	12	**European, Ltd.**	23—24	..	5 0 0
354,060	10	,,	12	Do. £7 10s. paid	16¼—17⅛	..	5 2 10
15,182,590	Stk.	Feb. 13	4⅛	**Gas-light and Coke** 4 p.c. Ord.	95—97	..	4 10 10
2,600,000	,,	,,	3⅛	3⅛ p.c. max.	87—89	..	3 18 8
3,799,735	,,	,,	4	4 p.c. Con. Pref.	106—109	..	3 13 5
4,193,975	,,	Dec. 13	3	3 p.c. Con. Deb.	83—85	..	3 10 7
258,740	Stk.	Mch. 12	5	**Hastings & St. L.** 3½ p.c.	91—96	..	5 4 2
82,500	,,	,,	6⅔	Do. 5 p.c.	112—115	..	5 13 1
70,000	10	Oct. 11	11	**Hongkong & China, Ltd.**	19—20	..	5 10 0
4,940,000	Stk.	Nov. 14	8	**Imperial Continental**	178—180	..	4 8 11
473,600	Stk.	Feb. 13	3½	Do. 3½ p.c. Deb. Red.	93—95	+1	3 13 8
195,242	Stk.	Mch. 12	6	**Lea Bridge Ord.** 5 p.c.	113—118	..	5 1 8
561,000	Stk.	Feb. 27	10	**Liverpool United A**	220—222	..	4 10 1
718,100	,,	,,	7	Do. B	161½—163½	..	4 5 8
306,083	,,	Dec. 30	4	Do. Deb. Stk.	106—108	..	3 14 1
152,736	Stk.	Feb. 13	7⅛	**Maidstone** 5 p.c.	136—141	..	5 8 2
75,000	5	Nov. 28	5	**Malta & Medn., Ltd.**	4¼—4⅝	..	5 5 3
560,000	100	Oct. 1	5	**Met. of** 5 p.c. Deb.	101—103	..	4 17 1
250,000	100	,,	4½	**Melbourne** 4½ p.c. Deb.	101—103	..	4 7 5
541,920	20	Nov. 14	3½	**Monte Video, Ltd.**	10½—11½	..	6 1 9
1,775,892	Stk.	Feb. 27	4⅝	**Newc'tle & G'tesh'd Con.**	106—107	—⅛	4 6 5
418,462	Stk.	Dec. 30	3½*	Do. 3½ p.c. Deb.	87—88	..	3 19 7
15,000	10	Feb. 27	10	**North Middlesex** 10 p.c.	20—21	..	4 15 3
55,940	10	,,	7	Do. 7 p.c.	13½—14½	..	4 16 7
300,000	Stk.	Nov. 28	8	**Oriental, Ltd.**	142—145	+2	5 10 4
60,000	5	Mch. 27	7	**Ottoman, Ltd.**	6—6¾*	+¼	5 7 8
398,490	5	Oct. 30	7	**Primitiva Ord.**	6¾—7	—¼	5 0 0
796,980	5	Jan. 30	5	Do. 5 p.c. Pref.	4¼—5¼	..	4 17 7
488,900	100	Dec. 2	4	Do. 4 p.c. Deb.	93—95	..	4 4 3
1,000,000	10	Oct. 11	8	**River Plate Ord.**	13½—14	..	5 14 4
312,650	Stk.	Dec. 30	4	Do. 4 p.c. Deb.	93—95	..	4 4 3
250,000	10	Sept. 27	8	**San Paulo, Ltd.**	13⅞—14	..	5 14 4
125,000	50	Jan. 2	5	Do. 5 p.c. Deb.	49—51	..	4 18 0
135,000	Stk.	Mch. 12	10	**Sheffield A**	243—245*	+2	4 1 8
209,984	,,	,,	10	Do. B	243—245*	+2	4 1 8
523,500	,,	,,	10	Do. C	243—245*	+2	4 1 8
70,000	10	Nov. 14	10	**South African**	14⅞—15⅜	..	6 9 0
6,429,895	Stk.	Feb. 13	5⅛	**South Met., 4 p.c. Ord.**	121—123	..	4 6 8
1,895,445	,,	Jan. 16	3	Do. 3 p.c. Deb.	83—85	..	3 10 7
209,820	Stk	Mch. 12	8	**South Shields Con. Stk.**	154—156	+4	5 2 7
605,000	Stk.	Feb. 27	5⅛	**S'th Suburb'n Ord.** 5 p.c.	116—119	..	4 9 7
60,000	,,	,,	3	Do. 5 p.c. Pref.	118—121	..	4 2 8
117,058	,,	Jan. 16	5	Do. 5 p.c. Deb. Stk.	120—125	..	4 0 0
502,310	Stk.	Nov. 14	5	**Southampton Ord.**	107—112	..	4 9 3
120,000	Stk.	Feb. 27	6⅔	**Tottenham** A 5 p.c. and B 3½ p.c.	.20—125	..	5 8 0
398,940	,,	,,	5⅛		101—104	..	5 1 0
149,470	,,	Dec. 13	4	**Edmonton** 4 p.c. Deb.	59—102	..	3 18 5
182,380	10	Dec. 30	8	**Tuscan, Ltd.**	10⅞—10⅝	..	7 8 10
149,900	10	Jan. 2	5	Do. 5 p.c. Deb. Red.	98—100	..	5 0 0
193,742	Stk.	Feb. 27	5	**Tynemouth** 5 p.c. max.	105—107	..	4 13 6
255,636	Stk.	Feb. 13	6⅔	**Wands-worth and Putney** B 3½ p.c.	128—133	..	4 17 9
80,075	,,	Dec. 30	3	3 p.c. Deb. Stk.	73—78	..	3 16 11
845,872	,,	Feb. 27	5⅛	**West Ham** 5 p.c. Ord.	101—104	..	4 18 6
185,000	,,	,,	5	Do. 5 p.c. Pref.	118—120	..	4 3 4
228,300	,,	Dec. 30	4	Do. 4 p.c. Deb. Stk.	102—107	..	3 14 9

† Next dividend will be at this rate. Prices marked * are "Ex div."